

AMERICAN ARTISAN

NOVEMBER 1958

Single copy price 60c

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CENTRAL RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING • SHEET METAL CONTRACTING

STANDARD TOOLS, adapted to do special
jobs, increase productivity of "self-
sufficient" sheet metal shop

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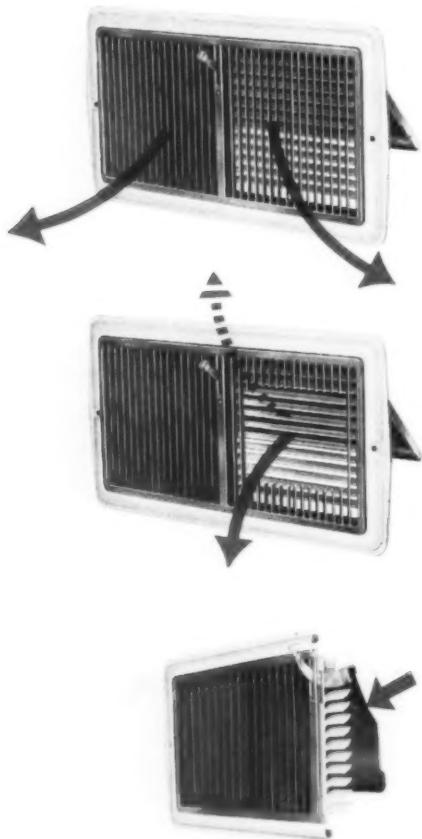
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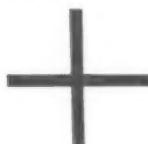
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AMERICAN ARTISAN

...The Magazine of

CENTRAL RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

NOVEMBER 1958

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Founded 1864; Vol. 95 No. 11

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Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A. Copyright 1958 by Keeney Publishing Company.

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Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"



Yearly Subscription Price—U.S. and possessions, \$3.00; Canada, Cuba, Mexico, South America, Central America, \$4.00; Others \$6.00. Single copies, U.S. and possessions, 60c. Back numbers, 85c. January, 1958, Directory Issue, \$1.50. SECOND CLASS POSTAGE PAID AT CHICAGO AND MENDOTA, ILL.

SUBSCRIBERS—Change of Address: Publisher needs five weeks' advance notice, mail address from current issue envelope, and new address with city postal zone number. Mail to . . . American Artisan, 6 N. Michigan Ave., Chicago 2, Ill., U. S. A.

POSTMASTER: When Magazine Is Undeliverable: Send Form 3579 to publisher at above address. Include city postal zone AND DATE on last line under mail address on envelope as our key.



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Sectional Gas-fired Heating Equipment
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more



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the editor's notebook

Thumbing Through This Month's Artisan

. . . we are reminded of the importance of following recommended procedures to *Design Return Systems for the Job at Hand* by Guy A. Voorhees who discusses: 1) single return for the entire house; 2) central returns for both basement and upstairs; 3) separate returns for each room or group of rooms and basement; and 4) fresh air intake with any return air system. The author applies these commonly employed return arrangements to typical cases and offers suggestions for good practice based on his experience with dealer-contractors' classes and NWAHACA manuals and field tests.

Layout

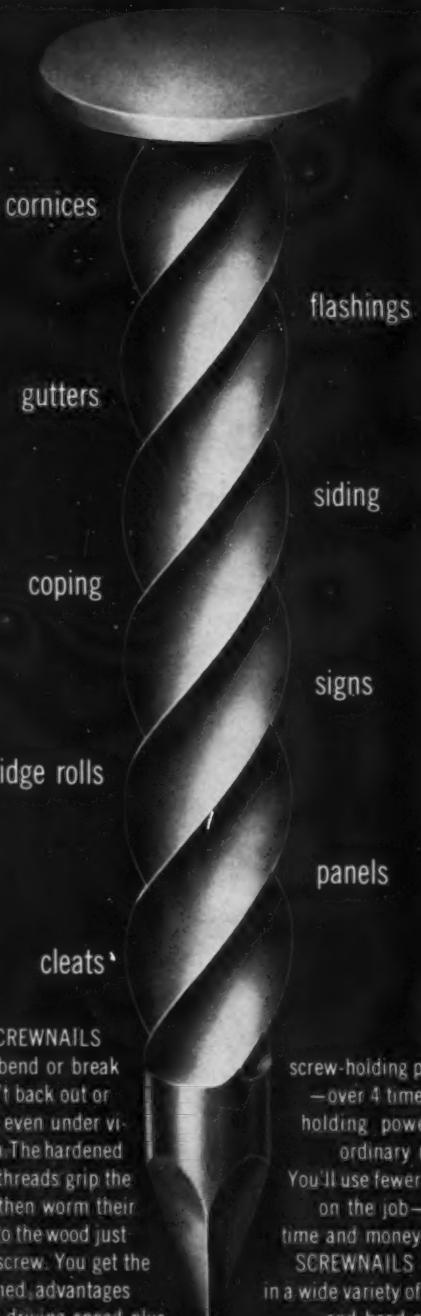
. . . and we find a new feature added to Hugh Reid's monthly pattern problem, this month entitled, *Here's Simplified Layout for a Double Tapered, Slotted Exhaust Hood*. We find with each problem a suggested time limit for completion of the pattern layout. At first glance the layout time may seem inadequate to those who haven't yet adopted Mr. Reid's Simplified Method, but we quickly realize how this new and accurate approach to sheet metal pattern development can cut costly layout time considerably and can be applied to all types of layout work.

Contest

. . . we note that a *Dealer-Contractor Wins Leads in 'Oldest Furnace' Contest* which proved to be the most productive promotion he's ever undertaken. We see that the newspaper contest to find the oldest

for fastening sheet metal to wood

P-K hardened SCREWNAILS



P-K SCREWNAILS won't bend or break — won't back out or loosen even under vibration. The hardened spiral threads grip the metal then worm their way into the wood just like a screw. You get the combined advantages of nail-driving speed plus

screw-holding power — over 4 times the holding power of ordinary nails!

You'll use fewer nails on the job — save time and money. P-K SCREWNAILS come in a wide variety of sizes and head styles.

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PARKER-KALON® fasteners

PARKER-KALON DIVISION, General American Transportation Corporation
Peekay Drive, Clifton, New Jersey

the editor's notebook

(Continued)

furnace in his market area paid off four ways: 1) four sales were closed and 11 bids submitted; 2) local newspapers were intrigued and added editorial support; 3) the firm found 70 good modernization prospects among entrants; and 4) the contest aroused community interest and introduced future prospects to the company. Won by the owner of an 80-year-old furnace, the contest afforded the firm an opportunity to discuss modernization with home owners whose need was apparent and set up future sales.

Cooling

. . . we study various types of heating and air conditioning system arrangements to help us *Design Add-On Air Conditioning to Fit in* with the existing heating system in modernization work. We review six basic types of central air conditioning systems and consider the adaptability of each to existing forced warm air systems, gravity warm air systems, floor or wall furnaces, hot water or electric radiant heat systems, and hot water or steam radiator arrangements. We find that a careful review of each combination will assure efficient and economical year 'round comfort systems and satisfied customers.

How to Detect Zinc On Stainless Steel

HAVE YOU been having trouble with some of the welds your journeymen have been making on stainless steel items? It could be caused by the formation of undetected zinc particles left on the stainless steel during its forming operations.

What happens is that zinc

These Are The Reasons Why Lockformers Never* Wear Out ...

* Well... maybe "never" is a few days too long, but Lockformers delivered 20 years ago are still going strong!

1

ONE-PIECE ROLL/GEAR CONSTRUCTION

On all Lockformers, Pittsburgh Rolls and gears are cut from one piece of solid steel; no taper pins or set screws to come loose or shift, no possibility of misalignment. Maximum strength—constant, perfect alignment.



2

NEEDLE BEARINGS USED THROUGHOUT

Pittsburgh Lock Rolls—as well as all other moving parts—are supported by Torrington needle bearings for greatly increased bearing life, proper shaft alignment and the strength to compensate for overloads well above rated capacity.



3

CASE HARDENED GEARS, SHAFTS AND ROLLS

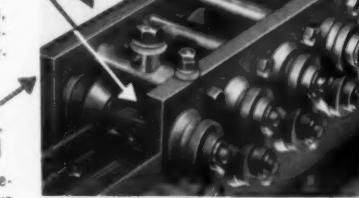
All rolls, shafts and gears case hardened and precision ground for extended service life. Heavy tooth, wide face, machine-cut gears minimize wear and provide a high overload factor.



4

DISTORTION PROOF STEEL SIDE-PLATE CONSTRUCTION

Heavy duty, fully machined side-plates are designed for continuous operation. No castings are used.



5

SIMPLICITY OF DESIGN

Easy, non-critical, foolproof operation. Anyone in the shop can operate a Lockformer. No delicate adjustments or special setups required.



One man and a Lockformer makes more Pittsburgh Locks than sixteen men and eight brakes.

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TIME SAVING, MONEY MAKING EQUIPMENT

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In Canada: Brown Boggs Foundry & Machine Co., Ltd., Hamilton, Ont.

6

EVERY PART LOCKFORMER-MADE

All component parts of the Lockformer are produced in our own plant—your assurance of top quality in every model produced.

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4615 W. Roosevelt Road, Dept. A, Chicago 50, Illinois

Please send me latest Lockformer sheet metal machinery catalog.

Name _____

Address _____

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the editor's notebook

(Continued)

particles from certain types of forming dies are left on a stainless surface and when the material is welded without removing the particles, the welding heat causes the zinc to penetrate into the grain boundaries of the stainless steel and the metal becomes damaged by cracking.

The research laboratories of the Armco Steel Corp. have developed a method of detecting this situation that can be used in any sheet metal shop. Here is what you can do. Dissolve 0.02 g. of dithizone (diphenyl thiocarbazone — Eastman #3092) in 100 ml. of 10% NaOH solution. Prepare fresh daily or as needed. Test paper can be any grade of acid-washed filter paper.

Here is how to do it:

1) Prepare comparison standards by marking "x's" on the surface of a stainless sheet with samples of essentially pure zinc, cadmium, and copper metals.

2) Dip a piece of filter paper in a beaker containing the dithizone solution, let drain for a moment, then lay on the marked surface of the standard.

3) In a few seconds each of these metals will produce a colored "x" on the paper, namely reddish purple for zinc, violet for cadmium, and purple for copper.

4) Treat the surface of the material on which zinc contamination is suspected as described in step 2.

5) Compare the unknown with the standard to determine if the surface is contaminated with zinc (or cadmium or copper).

Purpose of the test is qualitative detection of zinc on the surface of stainless steel sheets. It is based on the reddish purple color resulting from the reaction of zinc with dithizone in an alkaline solution.

INCREASE EQUIPMENT SALES ...cut down delivery costs

Sentry ODF® Tank Gauge tells drivers what they want to know at point of delivery!



ONLY Sentry OFFERS SUCH A COMPLETE LINE OF DIRECT AND REMOTE READING TANK GAUGES

Above is SENTRY'S newest — The ODF At-A-Glance tank gauge that's setting new records in building sales and customer goodwill. Located outside of building at fill pipe, this easy-to-read weather-proof gauge shows the exact oil level in the indoor tank. Saves costly time consuming trips to basement, unnecessary hose unreeling and eliminates over-flow. Permits delivery without disturbing customer.

Other constant-register SENTRY gauges include combination tank and remote reading, barrel gauges, direct reading, and gauges for stove and space heater tank. Write today for full information about these fast moving business getters. Advertising aids available.



KRUEGER *Sentry* GAUGES

GREEN BAY • WISCONSIN

the editor's notebook

(Continued)

Interferences are cadmium and copper, which produce somewhat similar colors, violet for cadmium and purple for copper. Yet these may readily be distinguished from zinc by comparing with the standards described.

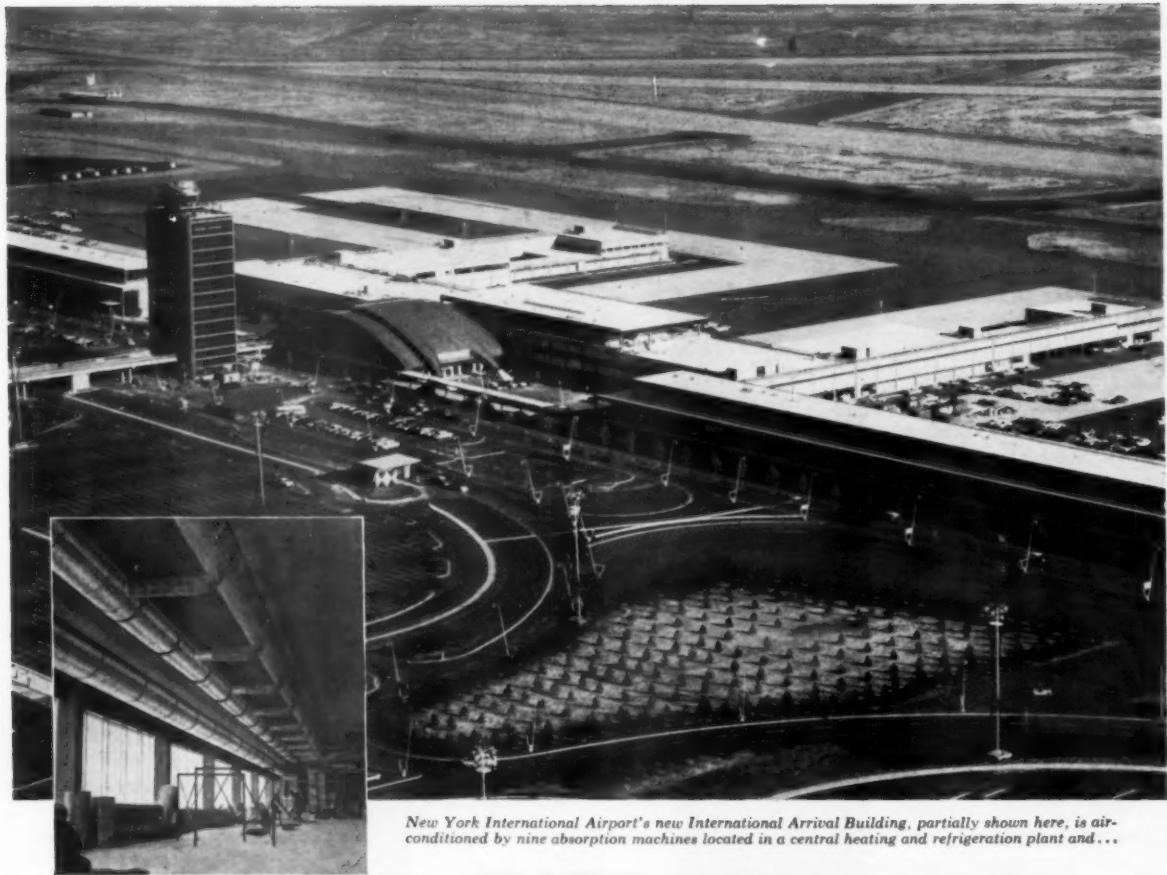
Other commonly occurring non-ferrous metals such as aluminum, lead, magnesium, tin, antimony and nickel produce no color and therefore do not interfere.

Losing Money Because Of Old Shop Equipment?

A RECENT SURVEY conducted by Dun's Review and Modern Industry confirms some of my beliefs regarding a situation frequently encountered in the sheet metal and warm air heating industry. The survey, conducted among 367 companies in 44 different cities, indicated that 95, or about one-quarter of the respondents, were operating equipment which was 22 percent obsolete. There is, in my opinion, a direct relationship between obsolescence of equipment and the cost of operating a sheet metal shop.

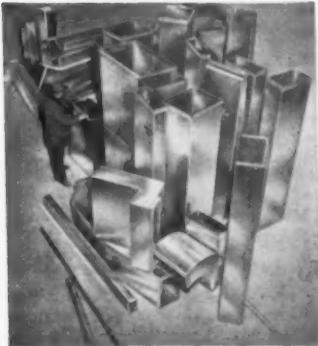
Some of the companies admitted that they could cut their overhead in production costs by installing improved equipment but were hesitant to accept the burden of financing the improvements. This point was covered by Francis L. Ashworth, Peck, Stow and Wilcox Co., in his address at the annual meeting of the Alabama Roofing, Sheet Metal and Warm Air Heating Contractors Association. He pointed out that sheet metal contractors can profit by replacing obsolete equipment and by so doing, they can get better production and save the time spent by mechanics in remaking faulty parts.

I hope that each of you will consider the equipment



New York International Airport's new International Arrival Building, partially shown here, is air-conditioned by nine absorption machines located in a central heating and refrigeration plant and...

Building's system was designed to a static pressure of 8" water. SOFTITE Cop-R-Loy used ranged from 16-gage for ducts over 18" in diameter to 22-gage for 8" or less.



Because sections were made up in Alpine's shop with short lead time on an "as needed" basis, Wheeling's dependable delivery was a big advantage.

5 miles of high-velocity trunk lines made of Wheeling SOFTITE® COP-R-LOY® Sheets

Although it's only three stories tall, Idlewild Airport's new 3,200'-long International Arrival Building has the high-velocity air-distribution system normally associated with skyscrapers. It was selected to minimize the space requirements of trunk lines and ducts in the extremely long structure . . . and to assure the best possible year-round air-conditioning in every part of it.

Using almost 250 tons of 16 to 22 gage Wheeling SOFTITE COP-R-LOY Galvanized Sheets, the lines and ducts were fabricated by the Alpine Sheet Metal & Ventilating Co., Long Island City, New York. The company's president is Mr. Marty Langberg, who says, "We knew this was going to be a tough job, so we used SOFTITE wherever possible. It's more durable, and the coating never chips or cracks."

You, also, can gain by using Wheeling SOFTITE COP-R-LOY Galvanized Sheets in your own air-handling jobs. Get proof from your nearby Wheeling warehouse or sales office. Wheeling Corrugating Company, Wheeling, West Virginia.



WHEELING CORRUGATING COMPANY—IT'S WHEELING STEEL

IMMEDIATE DELIVERY ON ALL STOCKED ITEMS FROM THESE WAREHOUSES: Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis SALES OFFICES: Atlanta, Houston

the editor's notebook

(Continued)

you have in your shop and find ways and means to replace obsolete pieces, thus increasing the overall efficiency of your operation.

New Process Gives Color to Stainless

I KNOW that sheet metal contractors specializing in stainless steel often are confronted with the problem of meeting a prospective customer's wishes for a color other than the silver finish typical of stainless steel. Those contractors will be pleased to know that stainless steel is now available in many colors.

The secret of this new look is the recently introduced Permyron process which produces an attractive, durable finish on stainless steel. The coloring will not chip or peel and is resistant to weathering and a wide range of corrosive materials.

Curtain wall panels made of colored stainless steel are being used in at least two large buildings now under construction.

Design of Equipment Important to Women

DON'T FORGET to "play up" the things that appeal to women when you're making your sales presentation. Those closest to women's whims are designers and they take advantage of the things they learn to influence women to favor their recommendations. It was interesting to me to read what Joseph Federico, Rochester industrial designer whose services are used by Carrier Corp., had to say. He said:

"The American woman has highly sensitive aesthetic antennae, and to a degree, design for her is emotion. Form, balance, color, all must be blended into a composition that will attract and hold feminine attention."



BIG STEP in Modernizing a Duct System

Seal it with Arno Ductape. Unsealed ducts can't be efficient. A test in a typical home increased air flow at room registers an average 21% — simply by sealing all accessible duct joints with Arno Ductape, which sticks instantly and holds permanently.

Customers like and gladly pay for results like this. It's a low-cost service that makes friends — and profits, too.

If you are not now using Arno Ductape why not make your own test of the income and goodwill opportunities of this service? We'll gladly send a sample roll for demonstration.

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Denver—1378 5th Street
Detroit—12915 W. Eight Mile Road
Fort Worth—2724 Tiller Street
Los Angeles—3225 East 46th Street
Minneapolis—401 Plymouth Ave. North
New York—104 West 17th Street

Arno
ADHESIVE TAPES, INC.

Subsidiary of The Scholl Mfg. Co., Inc.

Arno Adhesive Tapes, Inc., 4110 Ohio Street, Michigan City, Indiana

the editor's notebook

(Continued)

"I believe that the American woman has a lot more taste than she usually is given credit for. For instance, I've observed that she insists on design that 'lives well.' Brides today have more sophisticated tastes than their mothers did at their age. They should. They are exposed to good lines and harmonious organization in many ways. Magazines, newspapers, television and the movies all contribute to this education."

Recognizing these traits in women, aggressive dealer-contractors can direct their advertising—be it newspaper, radio, television or direct mail—toward these points. Sales presentations can be directed along the same lines with equally good results. Tailor your sales story to stress the importance of comfort as it blends in with balance, color and harmony.

To Make More Sales — Attend More Meetings

DON'T YOU often ask yourself, "Is this meeting tonight (being put on by the wholesaler or manufacturer) necessary?" There are so many things that a dealer-contractor can do that it's easy to pass up one meeting, then a second, and a third, until all are bypassed.

I'd like to suggest that those who have gotten out of the habit of attending meetings, and especially sales meetings, review their original decisions. Because this business, like all others, is going to become more competitive, and the fellow that has the most complete comprehension of the overall operation is going to find that his hill of beans will not be as hard to hoe as will be the fellow's who lets time pass him by.

Selling is a trade and those with the greatest skill will get

Look twice to
Complete line components for standard requirements
Coast-to-coast convenience for service and replacements



*air conditioning and
refrigeration*



Model 304C Automatic Expansion Valve offers two adjustment ranges: 10th vac. to 45 psig; 10th vac. to 75 psig. Designed for R-12, R-22, methyl chloride and sulphur.



Model 207C Thermostatic Expansion Valve with adjustable or fixed superheat. Pressure limit on special order. When an external equalizer is required, specify Model 207DE.



Model 65 Water Regulating Valve meters flow of water and other fluids in response to fluid pressure on valve bellows. Controls water flow to compressors and condensers.



Model 410 Trap-Dri, 100% moisture and acid removal with PA 400 silica gel. No appreciable pressure drop. 1/4" to 1/2" O.D. flare and 1/4" to 1 1/8" solder connections.

Here's just a sampling of industry's most diverse line of controls. Whatever your application problem — air conditioning, refrigeration, ventilation, gas, oil heating — it's under control when you choose from A-P's broad line of standard controls.

And A-P offers the backing of nation-wide service . . . in the refrigeration field alone, more than 400 jobbers are conveniently located coast to coast for quick, competent maintenance and replacement service. Write today for full details.



Model 235S Evaporator Pressure Regulating Valve is suitable for all refrigerants. 1/2 ton R-12, visual pressure setting from 0 to 40 lbs.

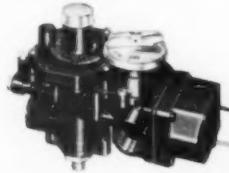


Model 274 Solenoid Valve — Largest of 4 new A-P solenoid valves that satisfy any application. Full range of orifice and connection sizes with capacities up to 60 tons.

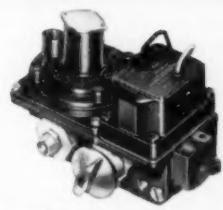
*gas heating and
cooking*



Series 5250 Gas Control for furnaces and unit heaters. Built-in pressure regulator. 100% safe ignition and shut-off. Flow interruptor with summer shut-down.



Series 55 Gas Control offers a choice of four automatic, interchangeable electric and non-electric thermostatic accessories. Satisfies any comfort preference.



Series 5010 Gas Control for manual or automatic heater operation. Nine big features. Available with magnetic operator.

oil heating



Model 2400 Oil Control has exclusive all-steel body. Safely maintains an even rate of oil flow to vaporizing type, oil-burning heaters and furnaces.



Model 2700 Comfort Control Kit provides electric thermostatic heat regulation for heaters and furnaces using A-P controls. Simple, fast installation.



Model 2709 Flexatemp Thermostatic Control Kit easily converts A-P 240V series single metering stem valves to dependable automatic operation.



CONTROLS COMPANY OF AMERICA

Manufacturers of A-P CONTROLS

2452 North 32nd St. • Milwaukee 10, Wisconsin
 Cooksville, Ontario • Nijmegen, Holland
 Controls That Make Modern Living Possible

the editor's notebook

(Continued)

the most and (most important) the best business. Speakers at these meetings are generally trained to get the points across quickly and to show that the answer to better sales is better presentation.

Dealer-contractors who have attended sales meetings and who continue to go have recognized that price alone is not the key to improved sales and have learned to sell the prospect on quality, features, performance and convenience. These sessions offer both product information and practical ways in which it can be applied in sales situations. For example, sales training people will not limit themselves to a discussion of a particular feature and how it works. They show salesmen how it can be made desirable and meaningful to the customer. An important additional result of the program is better informed customers. Most equipment today is loaded with good features that many prospects don't know anything about. A good salesman can thoroughly acquaint a prospect with those features so that he will get better use of them and, in consequence, more real satisfaction from his purchase.

Next time you learn about a sales session, make plans to attend and watch how the instructors conduct their sessions. Use their techniques both in your own selling and in instruction programs for your employees.

Wholesaler Builds Business on Service

WE ARE all familiar with General Electric Co.'s slogan, "Progress is Our Most Important Product." I like the way the Frank J. Kerscher Company, Manitowoc, Wis. wholesaler, has adapted this motto to the Kerscher company's slogan, which is "Serv-

Be MODERN-
with all your gas fired appliances...for safety, dependability and convenience use...

outside lighting



Just push the button and the Modern Lighter Tube does the rest . . . safely, conveniently. Engineered and fabricated to fit any gas fired unit and become a component of your equipment at a surprisingly low cost. The Modern Lighter Tube is widely accepted by manufacturers and utilities in areas where "outside lighting" is a requirement . . . be MODERN, investigate the advantages of this advancement in gas fired equipment.

(U.S. Pat. No. 2728384, Can. Pat. No. 676802).



Write for literature.

**MODERN
LIGHTERS**
INCORPORATED
NORTHLVILLE, MICHIGAN
FORMERLY
MODERN MATERIALS COMPANY

the editor's notebook

(Continued)

ice Is Our Most Important Product". The firm uses a fifteen minute slide film presentation to demonstrate the services offered to its dealer-contractors. This program is proving successful not only in retaining dealer-contractors located in areas served by other wholesalers but in getting new dealer-contractors to make their purchases from a company that serves the northern two-thirds of the state of Wisconsin and the Michigan peninsula.

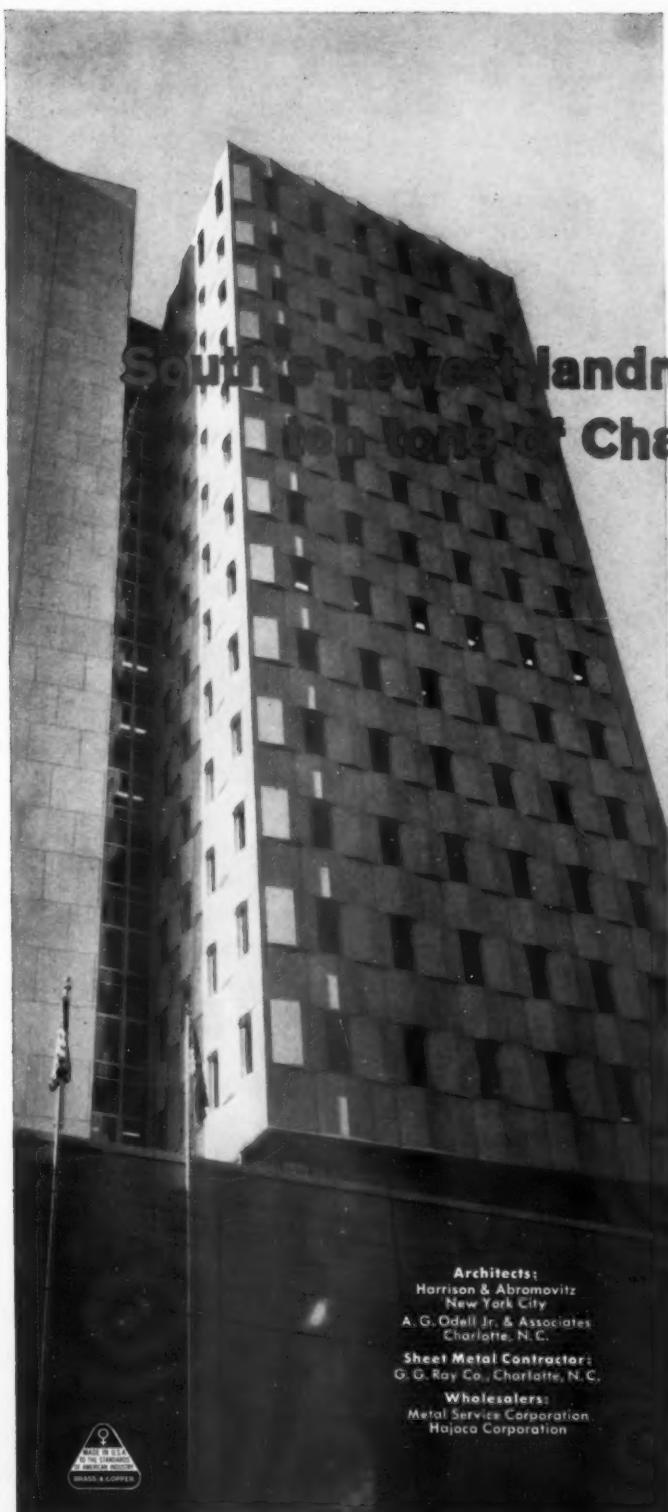
Offers Pointers to Aid In Roof Drainage Sales

I LIKE these sales pointers offered by the Roof Drainage Manufacturers Institute which were sent me recently. The institute points out that faulty roof drainage can be a serious problem to the home owner and may cause paint peeling, condensation in the attic or crawl space, wet basements and in cases where ice is formed during the winter, certain structural damage to the roof, eaves and fascia boards. To avoid such undesirable conditions, the institute says, home owners should make sure gutters and downspouts are properly sized and that they are installed in accordance with recognized procedures as followed by competent sheet metal contractors.

RDMI points out that the size of the gutter to be used depends primarily on the roof area, the pitch of the roof, the style of the gutters used, and the number of downspouts leading from the gutters. All of these are important features that should be stressed by sheet metal contractors when selling either replacement gutters or new jobs on new houses.

Clyde M. Barnes

EDITOR



Southern newest landmark protected by Ten tons of Chase® copper!



**Wachovia Bank & Trust Co.
building in Charlotte, N.C.
uses sheet and strip copper
flashing in construction**

First building in the United States to use prismatic, pre-cast concrete panels. First tower-type structure in the South. Largest office building in Charlotte. These are some of the records set by the striking new office building of the Wachovia Bank & Trust Company.

More than 25,000 lbs. of copper flashing by Chase protect the building against weather. Ten tons plus of sheet and strip copper and lead-coated copper were used in its construction.

Chase is ready to help *you* meet the needs of *your* construction projects—large or small, from residence to major office building. Let your nearest Chase District Office or Warehouse show you the many ways that low-cost, long-lasting copper can serve better, protect longer, add beauty to buildings. Or write Chase, Waterbury 20, Connecticut.

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Harrison & Abramovitz
New York City
A. G. Odell Jr. & Associates
Charlotte, N.C.

Sheet Metal Contractor:
G. G. Ray Co., Charlotte, N.C.

Wholesalers:
Metal Service Corporation
Hajoca Corporation

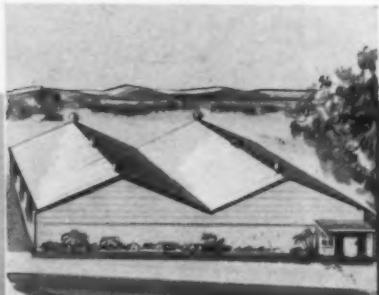
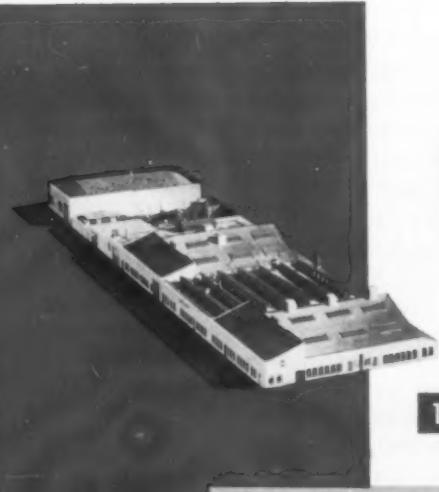


Five-million-dollar new home of Wachovia Bank & Trust Co. in Charlotte, N.C.—called one of America's most modern buildings.

Chase 
BRASS & COPPER CO.
WATERBURY 20, CONN.
Subsidiary of
Kennecott Copper Corporation

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark, New Orleans New York (Maspeth, L.I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury



THERMAC



COMPANY

14296 E. 6th Street • Corona, California
Redwood 7-3511

Our 25th Anniversary

-- a new factory

-- a history of growth

Thanks to our customers and friends



Almost everyone reading this announcement of our 25th anniversary and our new factory is closely associated in some way with the gas equipment industry, and for that reason has known the name Thermac for a good many years. A large majority of the leading gas appliance and furnace manufacturers in the nation are among our valued customers. This list of manufacturers, in fact, reads like a "WHO'S WHO IN AMERICAN BUSINESS," and to these we are most grateful for the progress Thermac has made during the past twenty-five years. Our growth was occasioned not only by the addition of new customers but by the special needs of regular customers for new, improved and lower cost gas control equipment.

It seems that we spend an unusually large amount of our time and resources in the development of new controls and tooling facilities to provide these controls on a mass production basis with the resultant low cost. We have worked closely with nearly all of the leading appliance

and furnace manufacturers to improve the performance and to lower the cost of control equipment. Quality and performance have not been sacrificed to meet competition. But rather quality and performance have been improved through increased efficiency, ingenuity and automation. This, in addition to supplying the finished product anywhere in the nation in the fastest time possible. In short, our slogan of "Service is our job—on-the-spot engineering assistance and immediate delivery" is being further realized through continuous research, development and improved manufacturing techniques made possible with our new factory which houses under one roof every facility from foundry to final inspection.

For these twenty-five years of continuous growth and progress we again say "thanks" to our many loyal customers, employees and friends.

Sincerely,

President





3500 POUND ENDURO STAINLESS STEEL DOME graces Our Lady of Consolation Shrine in Carey, Ohio. The dome, comprised of 44 stainless steel segments, Type 304, was fabricated by Fred Christen & Sons, Toledo, Ohio. Delivered in two pieces, the dome was welded together on the job site. ENDURO Stainless Steel was chosen because of its high strength, resistance to rust and corrosion and because stainless retains its lustrous beauty with minimum maintenance.



DOME FRAMEWORK partially covered with stainless steel segments.

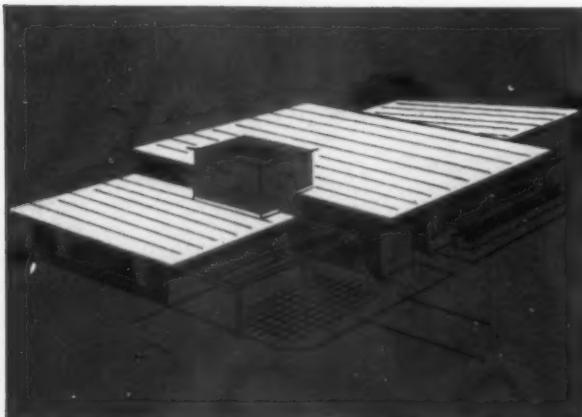
Stainless Steel PROFIT OPPORTUNITIES

Stainless steel business has always been profitable business. Now, new applications bring new profit opportunities to progressive sheet metal fabricators. Architectural applications in schools, churches, institutions, clubs, industrial and commercial buildings, even private dwellings, are unlimited.

Stainless steel, being easy to fabricate, presents no special problems nor does it require an outlay for special equipment. The examples shown on these pages were fabricated using standard sheet metal equipment.



THE ANIMAL MEDALLION was sculptured from stainless steel by Eliza Miller for Leechburgh Elementary School, Leechburgh, Pennsylvania. Sculptured stainless steel presents no special problems, nor is an outlay required for special equipment. Just a little artistic talent and your own equipment.



QUALITY BUILDINGS DESERVE REPUBLIC'S SPECIALLY PREPARED NEW AMBER COLOR ROSIN-BASE PAINTED TERNE METAL ROOFING. Easier to form — roll, bead, seam, or bend it quickly into the shape you need for any roofing application. Easier to solder—amber rosin-base paint actually increases solderability, even without fluxing. Also provides good bonding qualities for easily applied prime cover paint coat of any desired color. Slightly tacky surface reduces danger of workmen slipping on roof. Send coupon for complete details.



ROOF-DRAINAGE JOBS ARE PROFITABLE, TOO, when you install Republic ENDURO Stainless Steel gutters and downspouts. Both your builder and home owner prospects will listen when you talk rust- and corrosion-resistance, little or no maintenance, lower end cost. Installation is simple. Soldering is easy and requires no special tools. Mail the coupon for more information on the complete line of roof drainage products plus all accessories.

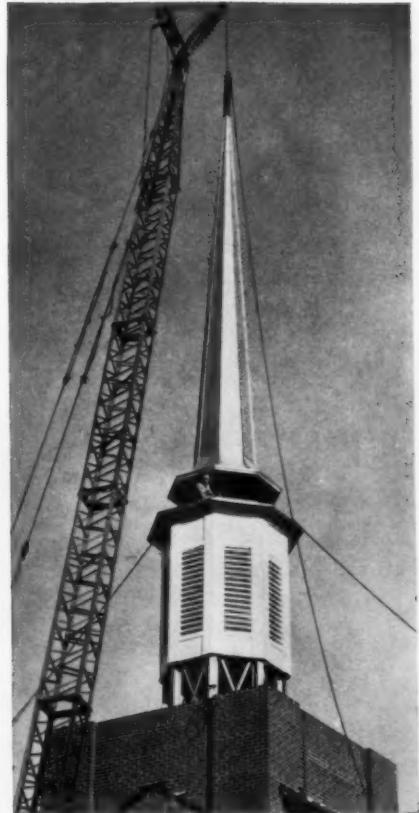
FOR SHEET METAL CONTRACTORS

Offer your customers the lasting beauty and maintenance-free advantage of sheet metal applications fabricated from Republic ENDURO® Stainless Steel.

Your ENDURO Stainless Steel Distributor—your Steel Service Center—will help you get started in this high profit stainless steel business. He will give you tips on fabricating—help you select the proper analysis for specific applications—provide fast, dependable service from complete stocks. Or write us for more information.



SIGNS OF THE TIMES. There's money to be made in permanently beautiful, easy-to-clean ENDURO Stainless Steel signs. They resist rust. They stay bright and attractive through all types of weather. Never need to be painted.



PROFIT OPPORTUNITIES are available on architectural jobs like this ENDURO church spire. Low maintenance costs, long life and enduring beauty help sell this type of application.

REPUBLIC STEEL

*World's Widest Range
of Standard Steels and
Steel Products*



REPUBLIC STEEL CORPORATION
DEPT. AA-5337-A
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:

- ENDURO Stainless Steel
- ENDURO Roof Drainage Products
- Terne Metal Roofing

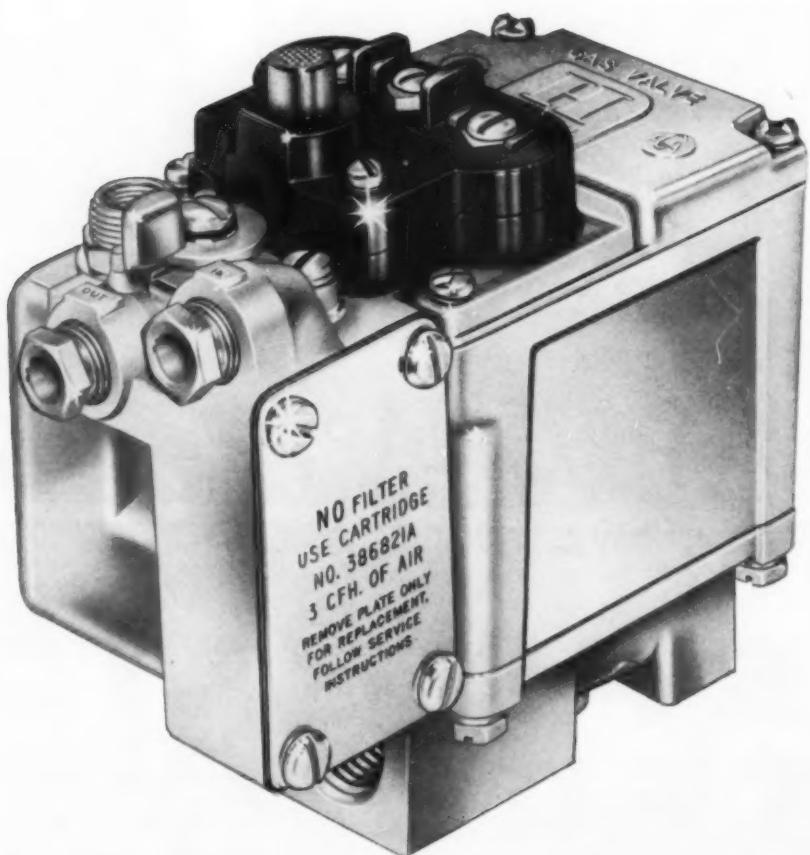
Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

SIM



V81 Silent Gas Valve with space-saving, switch-type pilotstat that eliminates cost of installing and wiring separate pilotstat. Has all the universally accepted features of the **V80 Silent Gas Valve** which combines advantages of solenoid and diaphragm valves, plus: oil-cushioned plunger, no bleed connections, operating parts sealed out of gas stream, and easy installation.

PLATE

Simple—that's your job when you don't have to spend hours looking for a special control. When you handle all-Honeywell control systems, it's doubly simplified because you deal with just one line, one supplier. What's more, Honeywell's way of doing business backs you up 100 percent. You get reliability; easier installations; fast help when and where you need it, from 112 sales-service offices; educational programs for your staff—and above all, far fewer costly call-backs. Added up, these benefits mean more profit from every job when your units have all-Honeywell controls designed to work together.

Ask your Honeywell man to prove it.

For information on Honeywell's complete line of control systems for heating and cooling, call your local Honeywell office. Or write Minneapolis-Honeywell, Dept. AA-11-20, Minneapolis 8, Minnesota. Honeywell sales and service coverage is world-wide.

Honeywell



First in Control

**IF YOU ARE IN
BUSINESS...**

**TO MAKE
MONEY...**

MONCRIEF

**IS PRICED
RIGHT...**

**TO BRING YOU MANY
ADDITIONAL DOLLARS!**



Winter Air Conditioner with Plenum Type Cooling Coil



Gas Counterflow Unit, showing complete Factory Assembly



Winter Air Conditioner with enameled Return Air Cabinet (an accessory).

Unexcelled Winter Air Conditioning Units

These Moncrief Furnaces are completely assembled and wired at the factory. Heavily constructed, they combine compactness, efficiency and attractive styling. Approved with high air deliveries for cooling!

Gas Fired: 75,000, 100,000, 125,000 and 150,000 Btu Input.
Oil Fired: 78,400 and 112,000 Btu at Bonnet.

**You Can Meet ANY Competition with
MONCRIEF's PREMIUM CONSTRUCTION!**

It is no longer necessary for you to be pinched by increasing prices, or to seek cheaply constructed units in order to be competitive . . .

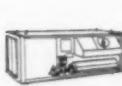
Because, today, your dollars are buying bigger than ever at your Moncrief Wholesaler's!

Today's complete line of Moncrief Furnaces and Air Conditioners is built better than ever, yet priced lower than ever in relation to competition.

Reason: Moncrief's manufacturing has proven more efficient and productive. Objective: Moncrief's costs have been held down while sales have increased. Result: Moncrief has not raised prices.

Moral: Call your Moncrief Wholesaler, now!

MONCRIEF is YEARS AHEAD WITH THE COMPLETE LINE FOR ANY TYPE OF INSTALLATION!



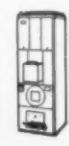
Horizontal Furnaces
4 Gas Sizes
4 Oil Sizes



Gas Duct Furnaces
4 Sizes



Gas or Oil Fired Winter A. C. Units



Gas or Oil Fired Utility or Counterflow Units



Gas or Oil Fired Gravity Furnaces



Gas Conversion Burners



Gas Fired Unit Heaters
5 Sizes



2, 3 or 5 H.P.
Air or Water Cooled, Gas or Oil Fired, Year 'Round A. C. Units



3 or 5 H.P.
Water Cooled Summer A. C. Units



2, 3 or 5 H.P. Air Cooled Summer A. C. Units with choice of "Circular" (Upflow) or "Flat" (Horizontal Flow) Cooling Coils

THE HENRY FURNACE COMPANY • Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF

FURNACE PIPE AND FITTINGS



Motors sell fast

Maybe not this fast, but with Century Electric motors you can cash in on added profits. Here's how:

Often you find jobs where selling a replacement motor is more practical than trying to repair an old one. In that case by selling a new Century Electric motor you do a better job for your customer and make more profit.

You see many places where this can be done. For instance, often furnace blowers, oil burners, pumps and many other kinds of equipment can readily take a new motor. And with Century Electric's complete line of motors you'll have the right motor for every job. A dependable quality motor that will help you

make a happy customer. You'll have a profit-making motor for all sizes, enclosures, speeds and mountings.

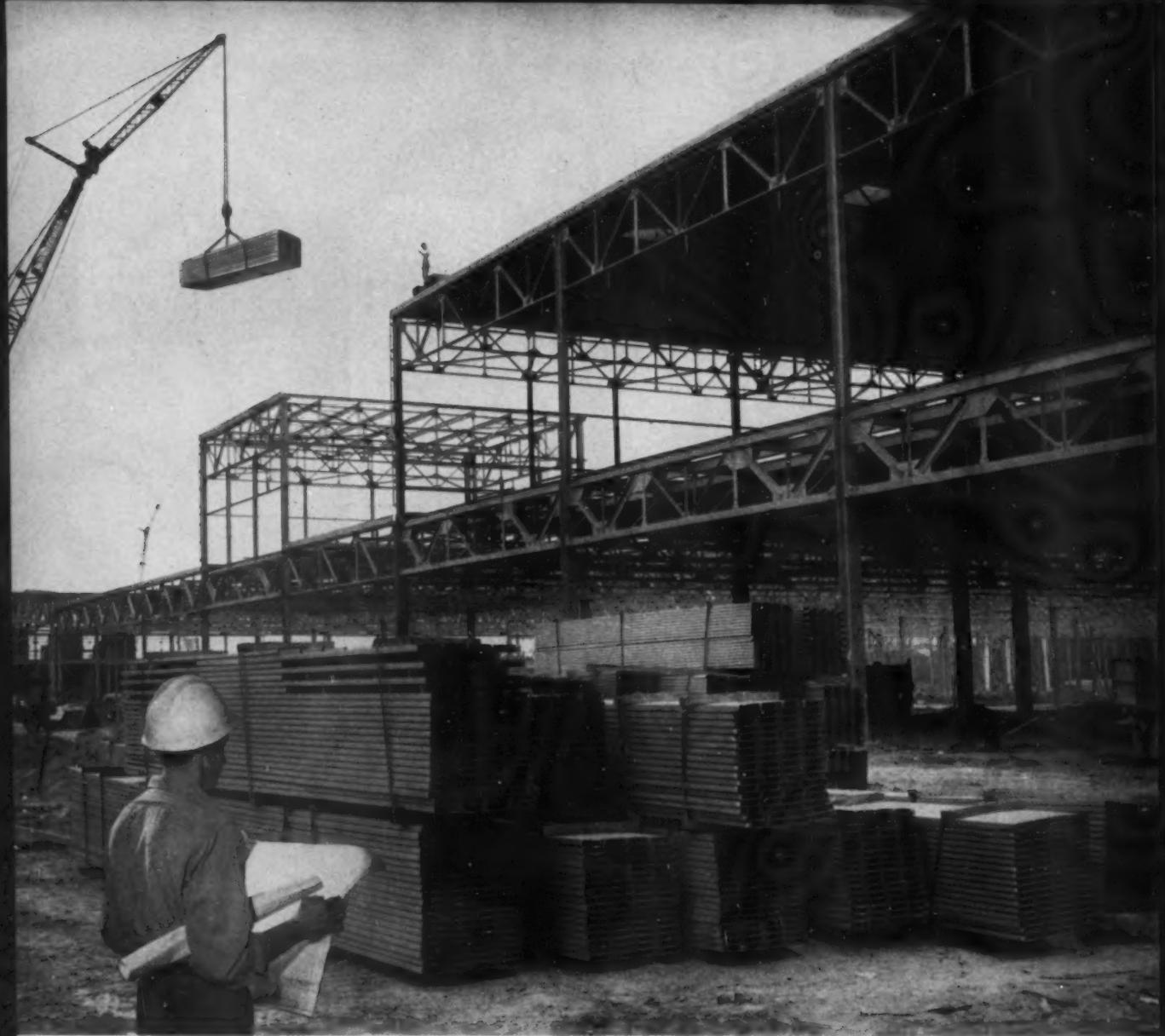
And to help you sell and display your Century Electric motors you can get this attractive metal stand. It holds five motors and requires only three square feet of floor space. To get one just write Century Electric Company and order 10 motors for resale. The stand is yours, free of charge. You can have one in about a week's time.

For more information on how you can make more money selling Century Electric motors, write Century Electric Company, 18th and Pine Street, St. Louis 3, Missouri.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri Offices and Stock Points in Principal Cities

Century
58-23



Erect more squares per day— do less welding—make more money

with Milcor Bonderized Deck

Here's steel roof deck designed with the contractor in mind. It's 24 inches wide—there's less welding to do. It comes as long as 28 feet 6 inches—covers faster. Die-set ends fit together easily, quickly. Ribs $\frac{3}{4}$ inch wide enable a man to weld from the top, eliminating the need for

costly fillet welding alongside each sheet as it is laid.

That's not all. Milcor's Bonderized, baked-enamel prime finish resists on-the-job damage—puts an end to many paint complaints.

Get all the facts. Write for catalog 240.

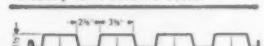
MILCOR Steel Roof Deck

INLAND STEEL PRODUCTS COMPANY Member of the **INLAND** Steel Family
DEPT. K, 4023 WEST BURNHAM STREET • MILWAUKEE 1, WISCONSIN

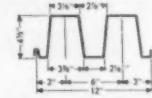
ATLANTA • BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT
KANSAS CITY • LOS ANGELES • MILWAUKEE • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS.



"A" Section — The standard of the industry for closed-rib decks.



"B" Section — Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel.



"C" Section — Carries normal roof loads over spans up to 20 feet.

WHAT'S HAPPENING . . . including Washington Letter

U.S. Heating Costs This Winter To Top \$5 Billion

NEW YORK CITY — More than \$5,000,000,000 will be spent for oil, gas, coal and electricity to heat over 46,200,000 American homes during the current heating season, according to a study recently completed by the National Fueloil Council.

Oil and gas are being used almost exclusively to heat new homes, the council reports, and an increasing number of older homes are converting to gas and oil fired heating systems. The study shows that oil is being used in some 9,028,284 centrally heated and 7,000,000 non-centrally heated homes. Gas is used as fuel in approximately 9,797,800 centrally heated and an estimated 13,200,000 non-centrally heated homes. Coal heats less than 7,000,000 homes, according to the study, while electricity heats about 400,000, or less than 1 percent.

American homes, considered the best heated in the world, favor central heating, the council points out. The study shows that more than half the homes throughout the country — about 24,000,000 — are centrally heated.

SMACNA Issues Revised Code for Air Conditioning, Ventilating Work

ELGIN, ILL. — The Sheet Metal and Air Conditioning Contractors' National Association, Inc. recently issued the third edition of its Code of Trade Practice for Ventilating and Air Conditioning Work. Purpose of the code, first edition of which was published in 1950, is to encourage architects and engineers to prepare specifications in accordance with the provisions outlined, thus saving money for customers, avoiding most problems of jurisdiction, and pinpointing the responsibilities of all trades.

The code lists the following equipment and material and cites the ju-

Silver Shield, Research Top Subjects at Convention

CLEVELAND — The program for the National Warm Air Heating and Air Conditioning Association's 45th annual convention, to be held Dec. 4 and 5 at the Statler Hilton Hotel, will feature technical reports, dramatized skits, talks by outstanding industry members, and group participation sessions. Emphasis will be on "how to do it" information which those attending can take home and put to immediate use.

Chairman of the research advisory council, Keith T. Davis, manager, Gas Air Conditioning Div., Bryant Mfg. Co., will describe the objectives and purposes of NWAHACA's research activities at the University of Illinois. Reports on studies at Research Residence No. 4 will be presented by Herbert T. Gilkey, technical secretary of the association, and Donald R. Bahmfleth, mechanical engineering department, University of Illinois.

How the Silver Shield program can help solve the marketing problems of 1959 will be explained by F. L. Meyer, president of the association; Tom Byrd, first vice president;

risdictional agreement applying in each case: acoustical lining; air conditioning and ventilating central systems; air conditioning units; air washers; blowers and fans; casings; damper; diffusers for high velocity systems; duct work; filters; flexible connections; warm air furnaces; high velocity systems; hoods and canopies; housings; isolation bases; louvers; registers, grilles and diffusers; sound traps; unit heaters; and ventilators.

SMACNA suggests that each chapter obtain copies of the code for distribution to architects and engineers within its local area.

and F. J. Nunlist, second vice president. Further details of the program will be presented by Randall A. Nelson, James M. Martin and James D. Nolan of the association staff.

The need for dealer-contractors to develop more effective sales techniques will be covered in a talk entitled "Sales Approach to Silver Shield" by Carl W. Millson, vice president, sales, Perfection Industries Div. of Hupp Corp.

How effective teamwork between manufacturers, wholesalers and utilities will pay off under the program will be discussed by Harry C. Gurney, general sales manager, Heating and Air Conditioning Div., Surface Combustion Corp.; Peter G. Pfriem, sales manager, The Cincinnati Stamping and Furnace Co.; and Charles H. Burkhardt, national secretary, Distribution Div., Oil Heat Institute of America.

A report on the Kalamazoo Silver Shield program will be presented by a panel moderated by Homer F. Brundage, board chairman, Brundage Co., who is also a member of the association's board of directors. Appearing with him will be officers of the Kalamazoo Indoor Comfort Bureau — dealer-contractors who are installing Silver Shield systems.

George Boeddener, managing director of the association, will conduct a "Problem Solving Session" on the second day of the convention. Panel members will include William H. Baker Jr., vice president, sales, American-Standard Air Conditioning Div.; O. U. Mutz, vice president, The Peerless Corp.; Clarence L. Grandstaff, chief application engineer, The C. A. Olsen Mfg. Co.; and Roland R. Taylor, application engineer, Fraser & Johnston Co. Others on the panel are Bert F. Dart, W. G. Morton, Inc.; N. T. Hess, Vorys Bros., Inc.; Redmond Greer, Greer Automatic Heat-

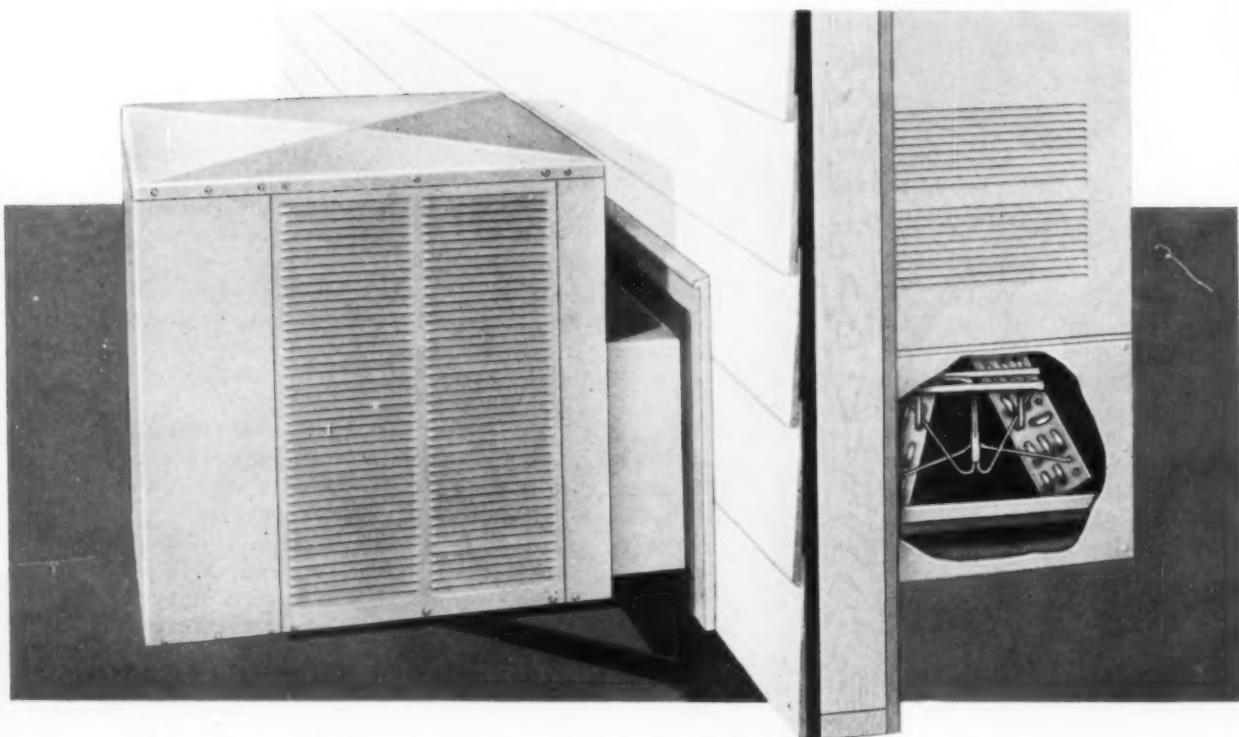
(Continued on page 26)

PLAN YOUR HEATING FOR THE SALES APPEAL

new Frigidaire Trans-Wall

SLIDES IN LIKE A DRAWER!

SLASHES INSTALLATION COST UP TO 50%!



PROVIDE FOR LOW COST AIR CONDITIONING NOW...OR
LATER—WITH EVERY NEW FURNACE YOU SELL!

**Another Frigidaire First! Installed
For a Year at NAHB Research House**

Here's a completely new concept in full-home air conditioning—the Frigidaire Trans-Wall System! New "slide-in" Trans-Wall Units are now in production after a full year in an actual installation at the NAHB (Home Builders) Research House, Kensington, Md.

The Frigidaire Trans-Wall System is the simplest, most compact year-round comfort maker ever devised. Here's why! The complete *all-in-one* Trans-Wall Unit consists of an air-cooled condensing unit with twin Super Meter-Miser Compressors plus a "wall-sleeve" that slides through wall to furnace, and a high-effi-

ciency "inverted V" cooling coil that fits into pre-installed housing to give full-home conditioning with any Frigidaire furnace.

Ready to Install—FAST!

All internal wiring is done, refrigerant lines connected, system sealed and checked by the factory. With the furnace located at an outside wall of the house and coil housing in place, all you do is slide Trans-Wall in place and wire in. Trans-Wall System utilizes furnace blower and ductwork.

Get the full profit potential story from your nearby Frigidaire District Headquarters *today!*

While Others Dream of the Future—

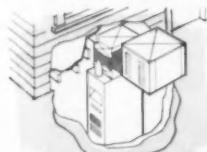
FRIGIDAIRE

OF LOW COST FRIGIDAIRE AIR CONDITIONING

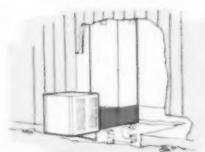
full-home air conditioner

**TRANS-WALL FITS EVERY TYPE FRIGIDAIRE FURNACE
—OR OTHER CONVENTIONAL FORCED-AIR SYSTEM!**

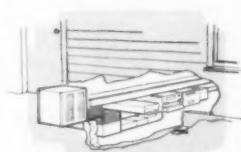
**New—completely self-contained
air-cooled package**
Simplified installation
No concrete base needed
Factory-sealed
**Uses furnace blower
and ductwork**
No plumbing for water supply
No refrigerant connections
**Two sizes
24,000 and 35,000 BTU/hr.**
Twin compressors



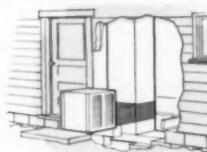
BASEMENT TRANS-WALL SYSTEM
Trans-Wall Unit slides into coil housing
above Frigidaire Vertical Upflow Type
Furnace. Adaptable to Lowboy Type.



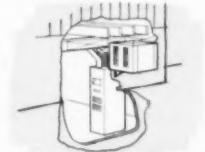
SLAB TRANS-WALL SYSTEM
Trans-Wall Unit installs under
Frigidaire Vertical Downflow
Type Furnace in housing.



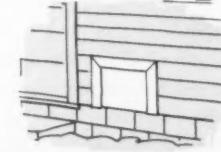
CRAWL SPACE TRANS-WALL SYSTEM
Frigidaire Horizontal Type Furnace.
Trans-Wall Unit installs in crawl space
with plenum added below coil housing.



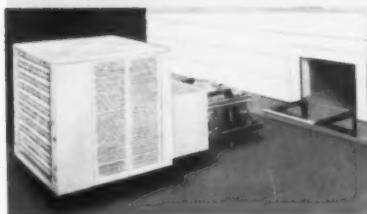
CRAWL SPACE TRANS-WALL SYSTEM
Trans-Wall Unit installs under
Frigidaire Vertical Downflow Type
Furnace. (Modified Slab hook-up.)



TRI-LEVEL TRANS-WALL SYSTEM
Trans-Wall Unit, bracketed above ground
level, installs in coil housing above
Frigidaire Vertical Upflow Type Furnace.



ROUGH-IN NOW—INSTALL LATER
Locate new furnace adjacent to outside wall,
add coil housing and prepare wall open-
ing. Slide in Trans-Wall Unit at later date.



SIMPLIFIED INSTALLATION! TRANS-WALL UNIT SLIDES INTO WALL OPENING 14" x 24"

Less than 350 lbs. net weight, new AIAZ-240 Frigidaire Trans-Wall Unit is easily installed by two men using ordinary tools. Trans-Wall easily adds a full 24,000 BTU/Hr. of Dry-Cool Comfort in virtually any style home after furnace and coil housing have been installed.

1. Rough-in opening. 2. Attach outside mount-
ing brackets (furnished). 3. Complete install-
ation by sliding Trans-Wall Unit in place—
connect control box (furnished) and wire in.
35,000 BTU/Hr. unit weighs 370 lbs. and re-
quires slightly larger wall opening 17½ x 24".

FRIGIDAIRE GAS OR OIL-FIRED FURNACES— A TYPE FOR EVERY NEED, A SIZE FOR EVERY HOME

Whatever size or style home, Frigidaire has the *right* heating equipment. It's all trimly compact, attractively styled in baked-on beige enamel finish, with smooth corners and safe, cool exteriors to give extra satisfaction to your customers. Extra value, too, because Frigidaire Furnaces are designed to team up perfectly with Frigidaire Cooling Equipment.



Choose from four types of furnaces: Vertical Upflow, Vertical Downflow, Horizontal or Lowboy. Adaptable to all sections of the country with choice of fuels including oil, or natural, artificial, mixed or L.P. gas. Capacities up to 190,000 BTU/HR for gas-fired models (A.G.A. approved) and up to 151,200 BTU/HR for oil-fired furnaces (listed with U.L.). Quiet, high-capacity centrifugal blowers. Factory-wired precision controls.

FRIGIDAIRE DIVISION,
General Motors Corporation, Dayton 1, Ohio

IS ON THE MARCH!



FRIGIDAIRE
Built and Backed by General Motors

(Continued from page 23)

Apprentice Training Advocate Given Testimonial Dinner

MILWAUKEE — Thirty years of faithful service to local and national apprentice training programs was recognized here Oct. 17, when a testimonial dinner was held for John Klatt, business manager, local 24, Sheet Metal Workers International Association. The dinner, given by the Milwaukee Area Joint Apprenticeship and Training Committee, was attended by over 300 persons coming from many parts of the country.

Guests included representatives of Milwaukee's city government, the state of Wisconsin's Industrial Commission, the daily and trade press, sheet metal contracting firms, unions, the Milwaukee Vocational School Board, manufacturing concerns, and wholesaler operations. The keynote speech was made by Wm. F. Patterson, special assistant to the secretary of the U.S. Department of Labor, who came from Washington, D. C., to name John Klatt a champion of apprentice training.

In describing the important role of apprentice training in the growth of the United States, both in the past and the future, Mr. Patterson explained how the country's skilled working force had contributed to shortening World War II and said that skilled labor must continue to work hard to be able to meet the needs of a population that is expected to reach 225 million in 1975. Mr. Patterson estimates that an 80 percent increase in the number of skilled sheet metal workers will be required to fabricate and install the products of this industry.

Other speakers commended Mr. Klatt for the untiring efforts he has made to help strengthen both local and national apprenticeship programs. "It's these solid training outlines, plus the quality of the equipment and material used, that make today's certificate of completion



JOHN KLATT (center) receives congratulations for his outstanding contribution to apprentice training from Wm. F. Patterson (left) and Frank Kramer

mean something both to the mechanic and the employer," said Robert S. Schmieder, executive secretary of the Sheet Metal Contractors' Association of Milwaukee.

N H A W Speaker To Tell How to Get Point Across

COLUMBUS, O. — The importance of oral communication in business will be discussed by a national authority on the subject at the forthcoming international convention of the National Heating & Airconditioning Wholesalers, to be held in Cleveland, Dec. 1-3. The speaker, David C. Phillips, is head of the department of speech at the University of Connecticut and has served as consultant or speaker for various groups throughout the country. He is the author of the book "Oral Communication in Industry," and has also written a number of articles on the subject.

Convention Focus On Silver Shield Program

(Continued from page 23)

ing; and John L. McManus, McManus Heating and Refrigeration. Keith T. Davis and Donald R. Bahnfleth will also assist Mr. Boedener.

Other speakers scheduled to address the convention are Lyle C. Harvey, senior vice president of the Carrier Corp.; John H. Brinker, vice president of the A. O. Smith Corp.; and John F. Biggi, manager of the National Wiring Bureau.

ASHAE Show to Feature Many New Developments

NEW YORK CITY — Scheduled for exhibition at the forthcoming International Heating & Air-Conditioning Exposition, to be held in Philadelphia Jan. 26-29, are a number of products recently developed for the heating, ventilating and air conditioning industry as well as equipment featuring new designs and other improvements. Considerable space will be devoted to exhibits of equipment for residential applications including furnaces, burners, water heaters, humidifiers and dehumidifiers, filters, motors, controls, insulation, etc. The exposition is being held under the auspices of the American Society of Heating & Air-Conditioning Engineers in conjunction with the 65th annual meeting of the society.

New Construction Continues Strong

WASHINGTON, D. C. — New construction activity in September matched the alltime high of \$4.8 billion set in August, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. The total dollar volume for the first nine months of 1958, amounting to \$36.4 billion, was up slightly from the comparable 1957 period.

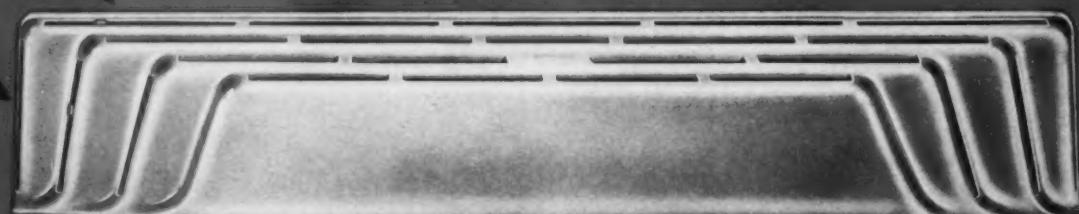
(More news on page 30)

NEW

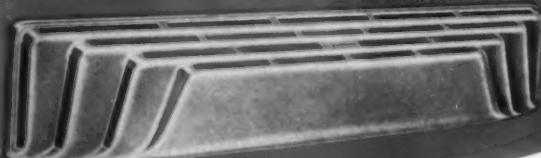
...today's first
adjustable—**FOR HEATING**
adjustable—**FOR COOLING**

PERIMETER DIFFUSERS

DUAL FINGERTIP CONTROLS



MODEL P-125 . . . WITH HEATING & COOLING ADJUSTMENT, DAMPER CONTROL



ECONOMY MODEL P-75 . . . WITH DAMPER CONTROL

designed by

TITUS

Today's MOST ADVANCED DIFFUSERS . . . AT A TRULY COMPETITIVE PRICE. Obsolete ALL others in APPEARANCE . . . DESIGN . . . PERFORMANCE!

Because they are FULLY ADJUSTABLE . . . the new Titus MODEL P-125 diffusers are today's only baseboard diffusers that can provide the proper throw and spread for obtaining maximum performance from BOTH HEATING AND COOLING SYSTEMS.

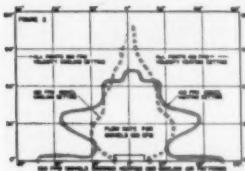
Years ahead in looks, too! New distinctive swept-line styling blends beautifully with any surroundings.

New ECONOMY MODEL P-75 has same, superb styling and basic ADVANCED design as Model P-125 except does not have dual adjustment feature. CAN GIVE YOU THE CONTRACT AGAINST ALL KINDS OF PRICE CUT BIDDING BECAUSE THEY ARE BETTER LOOKING, ARE CONSTRUCTED BETTER, ABSOLUTELY OUTPERFORM COMPETITION.

Both of these new Titus models have a large 32 sq. in. of free area. Both are quicker, easier to install. Provide lasting satisfaction — GIVE THAT EXTRA IN HEATING & COOLING COMFORT THAT MAKES AND KEEPS CUSTOMERS HAPPY.

PROOF!

Isovels from laboratory tests prove Titus new adjustable perimeter diffusers FAR SUPERIOR in PERFORMANCE! Dotted red line shows how cool air is forced to ceiling when Model P-125 diffuser is set for COOLING. Solid red line shows that when diffuser is set for HEATING warm air is diffused in broad pattern so it covers entire window or wall area.



WRITE FOR FREE CATALOG

TITUS MFG. CORP., WATERLOO, IOWA

- Rush new free illustrated Titus Perimeter Diffuser Catalog
- Send name of jobber nearest me

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____





WHY FOLLANSBEE TERNE?

BECAUSE no other roofing material has so uniquely stood the test of time. (Many Terne roofs are still sound after a century.)

BECAUSE many leading architects, builders and roofers have recently discovered that modern seamless Terne is better adapted than any other metallic or shingle surface to the special requirements of contemporary design.

BECAUSE Terne allows a fair profit margin to both the builder and roofer.

BECAUSE Terne is a definite plus-value for any project, and thus a strong selling tool in itself. And finally...

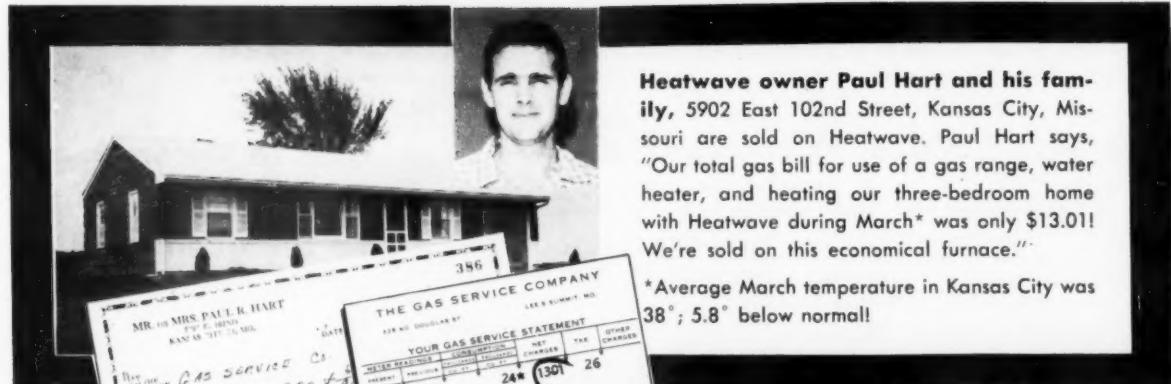
BECAUSE Follansbee within the next few months will bring Terne's basic story to the attention of every major architect in America.

SEND FOR COMPLETE INFORMATION

FOLLANSBEE
STEEL CORPORATION

FOLLANSBEE, WEST VIRGINIA

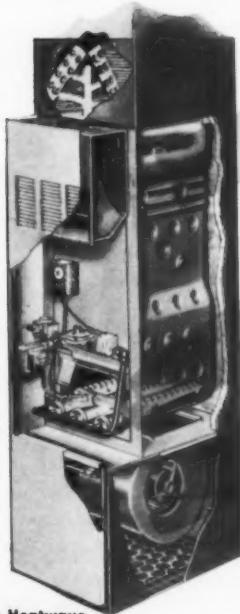
ALEXANDER MEMORIAL ARENA BUILDING, GEORGIA TECH/ARCHITECT: AECK ASSOCIATES, ATLANTA, GA./ROOFING CONTRACTOR: R. F. KNOX COMPANY, INC., ATLANTA, GA.



Heatwave owner Paul Hart and his family, 5902 East 102nd Street, Kansas City, Missouri are sold on Heatwave. Paul Hart says, "Our total gas bill for use of a gas range, water heater, and heating our three-bedroom home with Heatwave during March* was only \$13.01! We're sold on this economical furnace."

*Average March temperature in Kansas City was 38°; 5.8° below normal!

LOW HEATING BILLS HELP YOU SELL HEATWAVE!



The Heatwave
Hi-Soy with
evaporating unit

ZONE 1—HEAT EXCHANGER!
A heavy gauge, die-formed steel heatexchanger, electrically welded into a rugged one-piece, gastight unit, especially designed for rapid heat transfer.

ZONE 2—BURNERS! Cast iron burners with milled slots give clean, efficient operation! Heatwave is adaptable for LP installation, too!

ZONE 3—BLOWER! Sized for both heating and air conditioning . . . insuring proper circulation and maximum utilization of the heat produced by the Heatwave unit.

ZONE 4—INSTALLATION! Proper installation and sizing of unit to the job.

EVERY HEATWAVE UNIT IS ENGINEERED TO DELIVER MAXIMUM PERFORMANCE IN THESE "ECONOMY ZONES"

ECONOMY IN SUMMER, TOO!
Heatwave's new remote condensing unit with larger condenser face area gives lower operation head pressure and lower liquid temperature, resulting in lower operating costs and reduced mechanical failures in Heatwave's economical air conditioning. This season sell the unit that gives your customers more for their money . . . gives you more to sell . . . Heatwave year 'round air conditioning!

HEATING

HEATWAVE

AIR CONDITIONING

A Product Of The Southwest Manufacturing Company, Aurora, Missouri
A Subsidiary of The F. E. Myers & Bro. Co., Ashland, Ohio
... Manufacturers Of The Famous Myers Pump

WHAT'S HAPPENING . . . including Washington Letter

(Continued from page 26)

Two Sheet Metal Workers Honored By Washington Building Congress

WASHINGTON, D. C. — Thirteen building trades mechanics, among them two sheet metal workers, recently received recognition for outstanding work on projects constructed in the Washington, D. C., area during 1957. Frank Bonadio, secretary-treasurer of the Building and Construction Trades Department, AFL-CIO, presented the craftsmen with gold lapel buttons and appropriately lettered certificates at the Wash-

ton Building Congress Craftsmanship Awards dinner held at the Mayflower hotel.

A brief review of the craftsmanship awards program was given by Anthony Ferrara, chairman of the awards committee. He commended American craftsmen in general for their skill and competence, noting that several architects who had recently returned from Europe had been struck by the evidence of poor craftsmanship in contemporary European work. "Their travels certainly gave them an appreciation of the American craftsman and his ability," Mr. Ferrara stated.

The sheet metal award winners are Edward Edinger and John Hipkins, both of Gichner, Inc., Washington sheet metal contractor. Mr. Edinger, who was working foreman on the copper roofing job on the Pentagon building, Arlington, Va., received his award for working out the details of a trouble-free expansion joint which eliminates the need for soldering. Mr. Hipkins' award was based on his work in designing and fabricating metal cabinets to speed the sorting, labeling, identifying, classifying and disposal of films received for processing at the Kodak Processing Laboratories, Inc. Within a confined space he built easily accessible racks and shelves along with receptacles for the various types of films. The committee commended Mr. Hipkins for "an outstanding job of layout and fabrication."

Issues Standard For Heat Operated Air Conditioners

WASHINGTON, D. C. — The Air-Conditioning and Refrigeration Institute has issued Standard 250-58, "Unitary Heat-Operated Air Conditioning Equipment," covering units "whose major energy input is in the form of heat — either directly from gas or oil combustion, or from such energy sources as hot water, steam, or electric resistance units."

The standard provides that "ratings relating to cooling capacity shall be stated as the total cooling capacity and expressed only in terms of Btuh in multiples of 1000 Btuh; or equivalent tons, expressed in multiples of one-tenth of a ton (one ton being the equivalent of 12,000 Btuh)."

The institute has recently revised Standard 410, "Forced Circulation Air Cooling Units," and deleted Standard 411, which specified methods for testing and rating such units.

Revision of Standard 410 (now numbered 410-58) consists of elimination of the reference made to Standard 411 for testing and rating, inclusion of testing and rating provisions, and substitution of a reference to ASRE Standard 33-58, a joint ASRE-ASHAE standard, for methods of testing.

OHI '59 Convention To Be in Seattle

NEW YORK CITY — The Oil-Heat Institute will hold its 37th annual convention in Seattle, Wash., April 29 to May 2, 1959. This will be the first OHI convention to be held in the Pacific Coast area.

OHI to Offer Certificates To Servicemen

NEW YORK CITY — The Education Committee of Oil-Heat Institute, headed by Robert W. Hundley, general sales manager of Wm. Steinen Mfg. Co., has been authorized by the Distribution Division board to prepare examinations for servicemen of OHI members covering all phases of oil burner servicing. Copies will be supplied upon request to companies or OHI chapters, together with specific procedures for administering the examinations. Upon completion of the tests, the work sheets will be sent to OHI headquarters for grading. Servicemen who complete the examinations satisfactorily will be supplied with certificates stating that they are qualified service technicians.

Chamber Urges Cut In Capital Gains Tax

WASHINGTON, D. C. — Indications are that the next Congress will review the capital gains tax very closely, according to the Chamber of Congress of the United States. The chamber points out that the tax as it now stands has a number of major shortcomings including the following:

It has produced relatively little revenue.

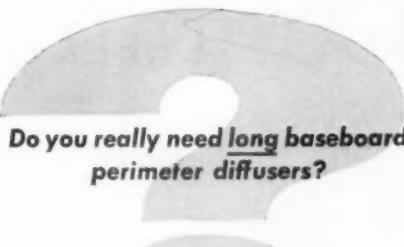
It has tied up a large share of the nation's equity capital in investments with limited potential for growth.

It has discouraged new business growth, as investors see no point in risking their savings on new enterprise when taxes sharply reduce the profits such investment would normally bring.

The chamber has advised Congress that the best stimulus to risk capital would be consistent reduction in the capital gains tax, pending eventual elimination. It will present the facts supporting this view to the next Congress.

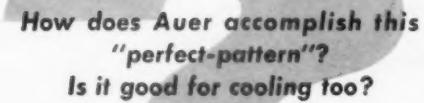
(More news on page 38)

FACTS about Baseboard Perimeter Diffusers!

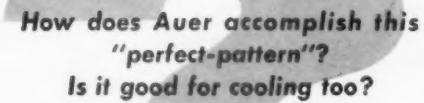


Do you really need long baseboard perimeter diffusers?

No! The Auer "Perfusaire" is only 18" long, but outperforms 4 to 8 foot units, yet has comparable capacity. Why pay more for larger, less effective units. "Perfusaire" has proven it can do a better job.



No other diffuser can match the perfect air-pattern of Auer's "Perfusaire". It meets all requirements for air diffusion with low air resistance so maximum throw and spread are achieved. The huge fan-shaped pattern of air heats entire wall surfaces providing even temperatures.

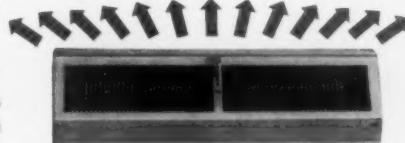


"Perfect-Pattern" diffusion is obtained through scientifically angled diffuser blades and an engineered built-in damper. This, coupled with Auer's "know-how" on efficient air-patterns, makes the big difference. Absolute proof and authority of Auer's theory for air-patterns on baseboard heating can be found on Page 769 of the Heating, Ventilating, and Air-Conditioning Guide, 1958 edition. To answer the other question, Auer "Perfusaire" is THE ideal unit for combination heating and cooling systems.

Without a doubt, Auer "Perfusaire" is your best buy for perimeter heating or combination heating and cooling systems.

It's been proven time and time again. The Auer "Perfusaire" is the mark of quality and performance in the industry. In addition to its engineered perfection, the "Perfusaire" is easy to install. The "Perfusaire" is provided with "knock-outs" to accommodate duct openings in sizes of either 2 1/4" x 14" or 2 1/4" x 12".

Send for descriptive literature on Auer's complete line of Registers and Grilles for every need.



AUER "Perfusaire"

For your next diffuser installation, select and install the Auer "Perfusaire" with complete confidence.

Auer

REGISTERS
and GRILLES

THE AUER REGISTER COMPANY

"REGISTERS AND GRILLES FOR EVERY HEATING AND COOLING NEED"

6602 CLEMENT AVENUE • CLEVELAND 5, OHIO

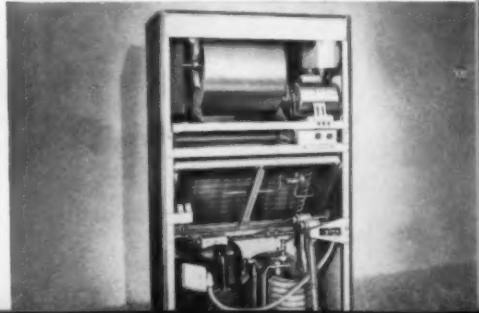
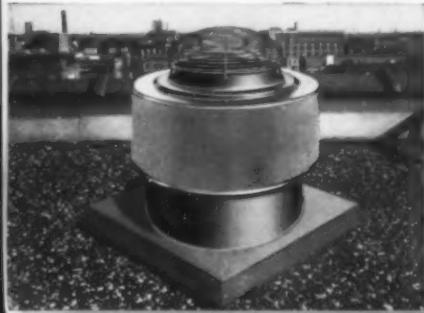
New models, new sizes, Trane Self-Contained



Air-cooled condenser (available for all sizes) features new, smaller dimensions, simplified piping and wiring for easy installation. Water-cooled condensers (all sizes) and evaporative condensers (10 through 20-ton sizes) also available.

Simplified construction speeds installation and service! All components of these new Climate Changers are easily accessible from front. Refrigeration cycle is easily removable for inspection, service on the job—or for in-shop repair or exchange.

Improved "iso-sound" design assures quiet, vibration-free operation. Cabinet and compressor housing completely insulated. Deluxe units may be installed in the conditioned space without disturbing occupants or employees.



new styling for Climate Changer Units

3 to 30-ton packaged units — air or water-cooled — are easier to install, easier to service

Here's the new line-up of TRANE Self-Contained Climate Changers for 1959: new air or water-cooled units in a complete range of sizes from 3 to 30 tons. And they're beauties! New, modern styling, clean, classic lines, smaller dimensions make them blend with today's office and store design. And, of course, these new units are engineered to the same rigid specifications that have made TRANE a leader in big building air condi-

tioning systems. They're easy to install, too, with just a few simple piping and wiring connections. Extra rugged construction makes them easy to ship and to handle on the job. So for your next "packaged" cooling job, make it a TRANE Self-Contained Climate Changer! Call your nearby TRANE Sales Office for complete facts on these new Climate Changer units—or write directly to TRANE, La Crosse, Wisconsin.

CHECK THESE FEATURES:

- **Easy to install**—Smaller dimensions for easy handling. Internal wiring completed, with low voltage circuit that's easier, safer to work with. Readily accessible water piping connection (on water-cooled models). Sturdy construction, with components mounted on independent frame . . . no strain on external cabinet.
- **Easy to service**—All components easily accessible from front panel. Removable refrigeration cycle can be serviced in field, or entire unit may be easily removed for in-shop repair or exchange.
- **Streamlined appearance**—Modern lines and new design blend with office or store decoration. Equally well adapted for free-standing or recessed location. New decorative return air grille instead of conventional return air louvers. Low heights for balcony, roof or suspended installation.
- **Quiet operation**—New, large slow-speed fans with adjustable belt drive for extra quiet air movement. All moving parts isolated, with spring-mounted compressor that absorbs vibration. Casing insulated throughout.
- **Flexibility**—Complete range of sizes, types. Water-cooled, air-cooled and evaporative condenser models. 3 to 30-ton capacities. Both vertical and horizontal rear discharge available by simple on-the-job fan rotation. Large, efficient fans with larger h.p. fan motors give full air capacity—even with long duct runs.

For any air condition, turn to

TRANE

MANUFACTURING ENGINEERS OF AIR CONDITIONING,
HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

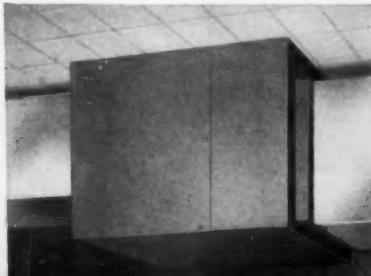
THE TRANE COMPANY, LA CROSSE, WIS.
SCRANTON MFG. DIV., SCRANTON, PA. • CLARKSVILLE, MFG. DIV., CLARKSVILLE, TENN. • TRANE COMPANY OF CANADA, LIMITED., TORONTO • 97 U.S. AND 19 CANADIAN OFFICES

There's a Trane Climate Changer unit to cool any home, store or office!

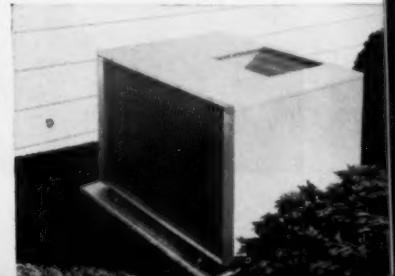
Heat and cool with this new Climate Changer combination unit. Warm air furnace in both oil and gas-fired models . . . complete range of sizes and types. Cooling section available in 2, 3 and 5-ton capacities.

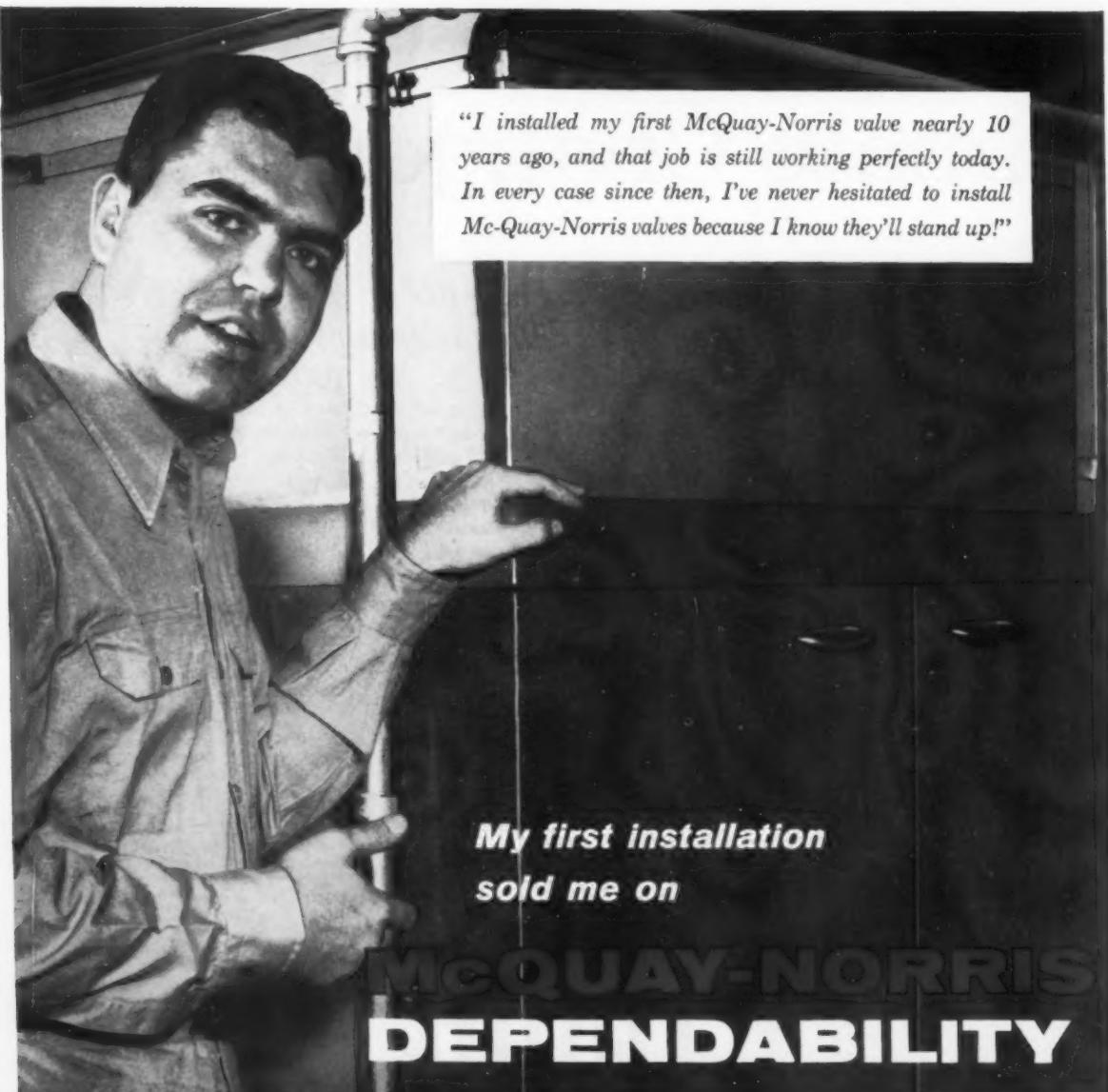


Save space with this compact Fan-coil Climate Changer! Tucks away in attic, closet, utility room—or may be installed behind partition or under ceiling. Provides crisp, cool air for store, home or office. 2, 3 or 5-ton.



No water needed! These TRANE Climate Changers are air-cooled, eliminating water supply and disposal problems. Compact condensing unit is located outside the home or building.





"I installed my first McQuay-Norris valve nearly 10 years ago, and that job is still working perfectly today. In every case since then, I've never hesitated to install McQuay-Norris valves because I know they'll stand up!"

*My first installation
sold me on*

MCQUAY-NORRIS DEPENDABILITY

The famous
McQuay-Norris
spring-loaded
soft-seat
Solenoid Valve

NOTE: Spring-loaded
soft-seat valves
were originated by
MCQUAY-NORRIS.



Features . . .

- Time Tested by leading manufacturers
- AGA and UL listed for use with natural, manufactured and liquid petroleum gases
- Soft-seat valve with positive seal
- Fail-safe—spring pressure always closes the valve
- Operates in any position
- Resists corrosion, stands up under extremes of temperature
- Stainless steel working parts, special analysis aluminum die casting in valve body, soft seat of special formula Buna N



MCQUAY-NORRIS

Manufacturing Company • St. Louis 10, Mo.

48 YEARS IN THE MANUFACTURE OF PRECISION PRODUCTS

At Your Fingertips...

A NEW DUCT CALCULATOR



J-80642

CALCULATE • EVALUATE • SELECT

these Readily Available Fans for Supply and Exhaust

- Cast Iron Industrial Fans
- High Efficiency Industrial Fans
- Airfoil Centrifugal Fans
- Ventilating Sets
- Axial Flow Fans
- Electronic Air Cleaners



Name _____

Firm _____

Title _____

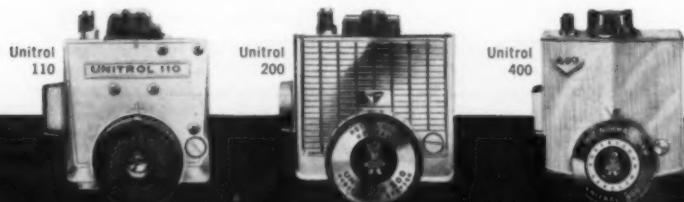
City _____ Zone _____ State _____

out of the blue sky...

ROBERTSHAW brings you

* water heater **UNITROLS** with pressure

- Increase gas burner ratings
- Improve ignition performance
- Make components more compact
- Simplify assembly



Now you have a selection of standard Unitrols 110, 200 or 400... or for these additional benefits, specify the Unitrol 110 R, Unitrol 200 R or Unitrol 400 R.

...into reality!

the **R*** series!

regulators built in!

Robertshaw announces the most advanced new water heater controls ever engineered—the **R*** series... new Unitrols featuring built-in pressure regulators to increase your water heater ratings and sales! The basic Unitrol functions of thermostatic gas valve, main gas cock, 100% automatic pilot, pilot adjuster and pilot filter are included in combination with a built-in pressure regulator.



UNITROL 400 **R**
The smartest way
to boost sales,
the ultimate in
appearance,
dependability and
efficiency... plus
a new built-in
pressure regulator.



UNITROL 200 **K**
The smarter
control with the
stepped-up
appearance to
step-up sales...
plus a new
built-in regulator!



UNITROL 110 **K**
The smart, low
cost water heater
control featuring
the dependability
and savings of the
Unitrol 110...
plus a new
built-in pressure
regulator!



INQUIRE TODAY... CONTACT
Robertshaw-Fulton

CONTROLS COMPANY

GRAYSON CONTROLS DIVISION • LONG BEACH, CALIFORNIA

Capitolaire

Model CDR Central Air Conditioner & Water & Air Heater

Model VCR Vertical Fan-Cool Unit Summer Cooling—Winter Heating

Model VEN Fan-Coil Units 200, 300, 400, & 600 CFM

Model RES Residential Air Conditioner 3 & 5 ton Water Cooled

Model VRS Fan-Coil Unit Summer Cooling—Winter Heating

Model RES Residential Air Conditioner Air Cooled 3 & 5 ton

Flexzone Horizontal Model Air Conditioner for multi-room applications. CFM capacities from 1800 to 24,000. Vertical model available.

Model CWG Water Chiller 7½ thru 75 tons

Model AEGR Air Conditioner with Built-In Evaporative Condenser 7½ thru 60 tons. Also available as water cooled.

The complete line of

- Residential
- Commercial
- Industrial

Air Conditioning Products



National-U.S. Radiator
CORPORATION

HEATING AND AIR CONDITIONING DIVISION
Johnstown, Pennsylvania

58-05

WHAT'S HAPPENING . . .

Johns-Manville, L-O-F Glass Fibers Consider Merger

TOLEDO, O. — Johns-Manville Corp. has proposed a merger with L-O-F Glass Fibers Co. on the basis of one share of its common stock for two and one-half shares of the glass company's common stock.

Sales, Inventories Up for Wholesalers

COLUMBUS, O. — The National Heating & Airconditioning Wholesalers, Inc. recently conducted a survey among its members to determine trends in sales, inventories and accounts receivable for wholesalers throughout the country. Results indicated the following national averages for the month of August:

Sales	Up 10.5 percent from July 1958
	Up 5.9 percent from Aug. 1957

Inventories . . .	Up 0.3 percent from July 1958
	Up 0.3 percent from Aug. 1957

Accounts Receivable . .	Up 0.6 percent from July 1958
	Up 2.8 percent from Aug. 1957

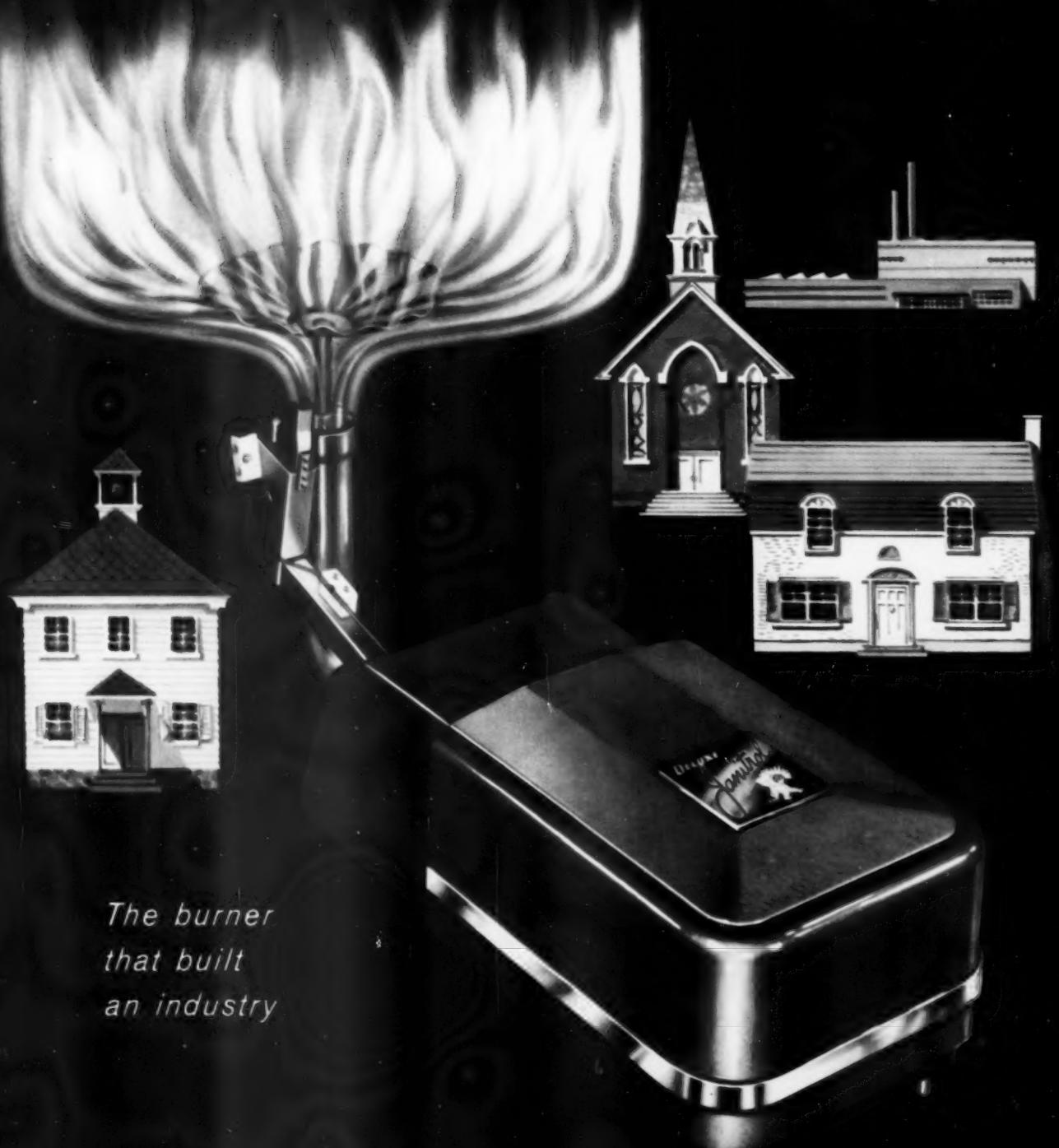
LA College Offers Course Covering Codes, Ordinances

LOS ANGELES — The Los Angeles Trade-Technical Junior College now offers a course giving instruction in code and ordinance requirements regulating safety, design and construction of heating, ventilating, air conditioning and refrigeration installations in Los Angeles. Classes are held two nights a week.

the quality tells...the quality sells

JANITROL

GAS CONVERSION BURNER



*The burner
that built
an industry*

Sell and Grow with JANITROL

The Conversion Burner that
Built an Industry!

New Janitrol JD DeLuxe

Streamlined, beautifully styled, totally enclosed. Features all the time-tested Janitrol features, plus exclusive new advancements to put you on top in sales and profits! LISTED BY A.G.A.



Input ratings from 75,000 to 325,000 Btu/hr. For natural, mixed, manufactured or LP-gas-air mixtures.

How will you score for sales and profits in the months and years ahead?

As a Janitrol dealer you can expect to move ahead . . . to get an ever bigger share of the millions of dollars spent every year for gas heating.

Plenty of these profit dollars are waiting for you in the new, complete line of Janitrol gas conversion burners. Fact is, ever since Janitrol originated the first gas conversion burner in 1926, Janitrol dealers have had the most advanced designs to sell, the biggest sales and profit opportunities.

Highlighted for you here are just a few of the exclusive Janitrol advancements and conversion burner models that can help you sell and grow. Look them over—then ask your Janitrol representative for all the facts, or mail the coupon!

JANITROL HEATING AND AIR CONDITIONING DIVISION
Surface Combustion Corp., Columbus 16, Ohio
In Canada: Moffats Ltd., Toronto 15

Please show me how I can SELL AND GROW with Janitrol Gas Conversion Burners and other quality Janitrol products for heating and air conditioning.

NAME _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____
Fill in and MAIL TODAY. No obligation.

Only
JANITROL
has it . . .

New TURBO-FLAME DIFFUSER . . . tops for efficiency and economy!

No other baffle, diffuser or similar device ever invented can match the TURBO-FLAME DIFFUSER! This exclusive Janitrol engineering development adds turbulence to the gas-air mixture for fast, more complete combustion. It spreads the flame over a larger area of the heat exchanger—boosts heating speed, efficiency and economy. The unique, conical diffuser of special alloy steel is resistant to heat and corrosion for long-life and trouble-free operation.

New Janitrol Automatic Pilot with micro adjustment is an extra safety feature . . . assures positive shutdown in event of gas or electric supply failure.

Ultra-Sensitive Thermostat holds room temperature constant . . . makes uniform comfort a part of your customer's daily living, no matter how cold the weather.

New Tapered Venturi accelerates mixture of gas and primary air for a new standard of heating efficiency.

Exclusive "Electro-Fyre" Lighting works on automotive spark principle to ignite burner at start of season. No matches, no stooping, no service call required.

Janitrol Model JF-Standard

Meets your need for a top quality burner at a competitive price. Features all of Janitrol's basic design exclusives. Solenoid valve (soft seat-quiet) and controls or self-generating controls. Totally enclosed in handsome casing.



Janitrol Model

SC-05 High Capacity This unusually compact inshot-type burner will clinch plenty of sales for you on larger installations. Input capacities up to 750,000 Btu/hr. Furnished with either conventional or electronic safeguard controls.



Janitrol

JH Gun Type Most popular burner of them all for replacement of oil-fired, pressure-type burners. Easy, labor saving installation. Features adjustable blast tube, pilot lighter, thermostat and complete safety controls. Input: 160,000 Btu/hr.



Webster Natural and

Forced Draft Burners For fast, efficient conversion of high capacity boilers. Available in gas or "dual-fuel" types—custom engineered for any installations. Capacities up to 50,000,000 Btu/hr. input, enabling you to cash in on the big industrial and commercial jobs.



Sell and Grow with **JANITROL**

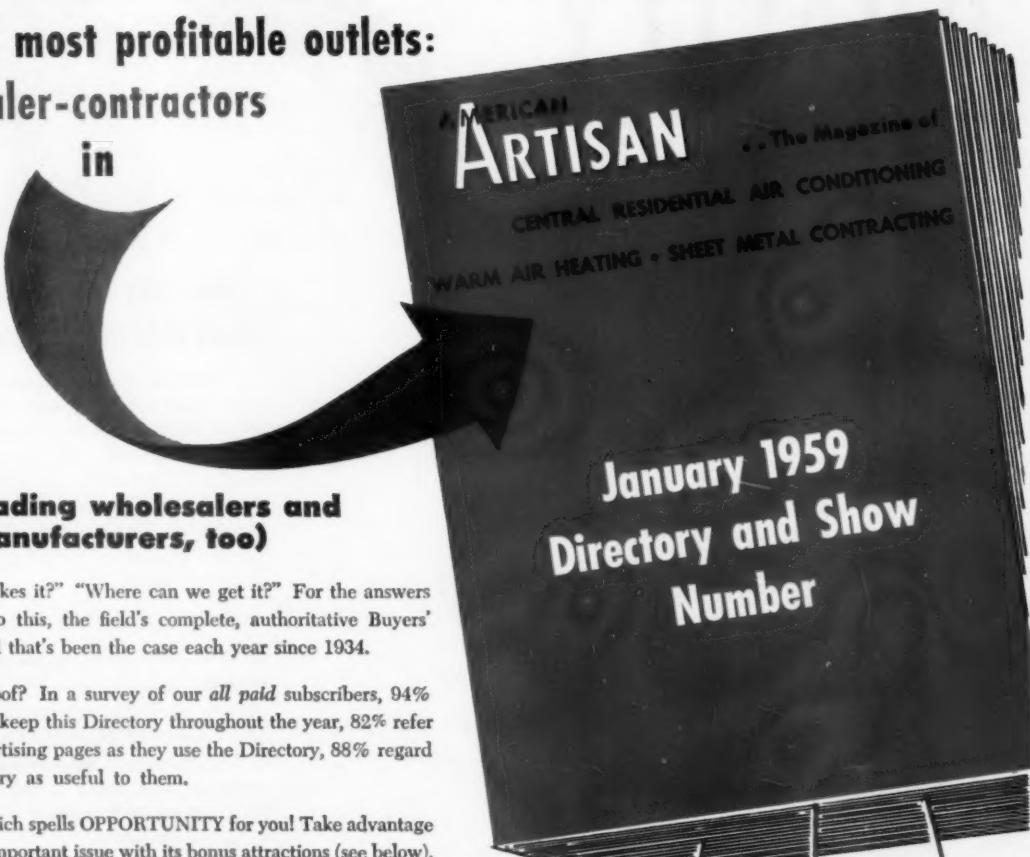
Ask your Janitrol representative for all the facts, or SEND COUPON TO US TODAY!

From Janitrol—a complete line of gas and oil furnaces, unit heaters, conversion burners, air-cooled summer cooling conditioners, combination heating-cooling conditioners.

KEPT... USED

by your most profitable outlets:
KEY dealer-contractors

in



(by leading wholesalers and manufacturers, too)

"Who makes it?" "Where can we get it?" For the answers they turn to this, the field's complete, authoritative Buyers' Guide. And that's been the case each year since 1934.

Want proof? In a survey of our *all paid* subscribers, 94% report they keep this Directory throughout the year, 82% refer to the advertising pages as they use the Directory, 88% regard the Directory as useful to them.

All of which spells OPPORTUNITY for you! Take advantage of this all-important issue with its bonus attractions (see below). Regular space rates apply. It is not a 13th or extra-cost number. Parade your entire line, tell your full story to those who count, those who mean the most to you in this field. Closing date, December 20.

An alphabetical listing of all products used in the field, and manufacturers of each.

A listing of all known trade names with the product and manufacturer identified for each.

Names and addresses of all these manufacturers.

All products advertised in this issue are classified and listed. This guides readers to the ad pages where they'll find more information on what they seek.

Normal editorial content of a regular issue assures immediate cover-to-cover attention.

PLUS A COMPLETE SHOW SECTION previewing the International Heating and Air-Conditioning Exposition in Philadelphia. Contents: a listing of all exhibitors and their products, a guide to the displays, complete programs of the meetings.



AMERICAN ARTISAN

KEENEY PUBLISHING CO. AIR CONDITIONING HEADQUARTERS

6 N. Michigan, Chicago

HIGHEST QUALITY SHEET STEEL



FOR EVERY HEATING AND VENTILATING REQUIREMENT

... you can count on quality-plus when you order from Ryerson. For instance, Ryerson galvanized sheets are bright, ductile, uniform in coating and true to gauge. They work and form easily... won't crack or peel. For galvanized sheets, or for any type of steel, look up to quality... call your nearby Ryerson plant.

SIX-WAY RYERSON SERVICE

1. **One sure source for all requirements**—whether steel is plentiful or scarce, nobody approaches the size and variety of Ryerson stocks.
2. **Exact length on net weight basis**—when your order is cut from stock width coils, we furnish 4' to 16' lengths in $\frac{1}{4}$ " increments.
3. **Correct weight**—and fair prices year in and year out.
4. **Good packaging**—tightly banded steel, skidded with sound lumber, cuts labor costs, protects steel, makes handling easier.
5. **Absolutely dependable delivery**—a priceless assurance when delays could cause idle manpower or even lost business.
6. **Ryerson Certified Quality**—all Ryerson steels are backed by rigid quality controls to protect you fully on every purchase.



RYERSON STEEL®

Member of the  Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structural, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

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Getting the Most for Your Insurance Costs?

WE'RE GLAD TO SEE that the Sheet Metal and Air Conditioning Contractors' National Association has prepared a report on the important subject of contractors' insurance. This report, summarized on page 66 of this issue, is quite timely. For example, a number of dealer-contractors we interviewed on recent editorial field trips have asked about this vital question of insurance coverage.

The report points out that in a highly competitive business — such as heating, air conditioning and sheet metal contracting — it's always wise to keep costs in line and in a reasonable ratio to the amount of annual sales. However, in the case of insurance, there is a minimum that should be carried; thus any figure suggested for use in determining how much money should be spent would be out of line for businesses operating in both lower and upper volume brackets.

Previous special study reports by SMACNA on insurance have emphasized the necessity of a thorough breakdown of operations to arrive at the proper premium costs. For instance, common sense tells us the risk of personal injury arising from careless installation of gutters, downspouts, flashings or clothes chutes may exist, but it is much more remote than the risk of personal injury after the installation of equipment such as a furnace or air conditioning system — little as that risk may be.

Some dealer-contractors submit a single contract for heating, air conditioning, gutters, flashing and clothes chutes. The sheet metal work, as distinguished from the heating and the air conditioning work, frequently accounts for a considerable percentage of the job, in dollar volume. This work should always be segregated so premium charges can be based on the volume of work to which each different premium rate applies. The segregation need not necessarily be shown in the contract, but it certainly should be made in the contractor's accounting books.

The SMACNA report shows how to reduce insurance costs, without gambling on a catastrophic loss, by purchasing so-called deductible insurance. Deductible insurance provides for a premium discount, which varies according to the amount of the insured's "retention." Frequently, the "deductible" discount, coupled with the experience rating discount awarded a dealer-contractor who has not had a serious claim history, results in a rather substantial savings on products liability insurance rates.

The report also recommends that dealer-contractors buy all liability insurance from the same company to avoid a question of insurance company responsibility if an accident should occur between persons employed by businesses carrying different types of accident insurance and with different insurance companies.

A reassessment of the cost and coverage of insurance policies now may enable the dealer-contractor to obtain better protection at lower cost the next time he renews a policy.



CONVENIENT parking and room for expansion are features of this dealer-contractor's new location

Dealer-Contractor's Building Designed To Catch Commuter's Eye

An attractive building seen from commuter trains is vital part of this dealer-contractor's merchandising. He feels building appearance is as important to his business as it is to an automobile dealer

A DEALER-CONTRACTOR does not have to have an attractive place of business to be successful. But judging by the trends of merchandising within the industry and without, an eye-pleasing and conspicuous building is becoming more and more important. Even the best dealer-contractor can find it an aid in maintaining and building business volume.

One company whose experience proves this point is Alpha, Inc., Clarendon Hills, Ill. (a Chicago suburb). This firm had built a good business in a few years in a rather poor location in neighboring Hinsdale. The company's old building was actually located on an alley, and working space was cramped and awkward. The shop was on the second floor, causing material handling problems. The growth of business soon forced the firm to seek larger quarters (and also made it economically possible).

Search for Site Complicated

For a new location the company wanted a site that would be readily seen by passing traffic, would be convenient and would have room for future expansion. How-

ever, finding a good site was not easy. Hinsdale-Clarendon Hills is primarily residential with high land values. The search was also complicated by zoning restrictions. One site was acquired but the company discovered that the land would be more valuable if used for another purpose.

Finally, a large site properly zoned was found on a street along the railroad in Clarendon Hills. Although the street is only lightly traveled, the railroad carries heavy commuter traffic. The building therefore would be seen by large numbers of people. Another convenient feature was a service alley in the rear, which is not too common in this area.

In designing the building, J. F. Cook, Jr., president, and Ernest J. Good, general manager, set out to make it as attractive as possible within economic limits. They visualized the front facing the railroad as a large billboard. Therefore, they sought to make it easy for commuters riding by in a train to catch the company name and its line of business. At the same time they wanted the appearance to be in good taste and to express quality.

As Mr. Good said, "We feel that an attractive place of business is a vital part of our merchandising program.



ENGINEERING is stressed by the company and the engineering office is attractive and pleasant

People make a big investment when they buy heating and air conditioning equipment. It's as important for us to have an attractive building as it is for an automobile dealer."

Objectives Well Attained

The pictures above show how well these objectives were attained. The handsome brick and concrete block structure contains 4000 sq ft. Additional land is owned on the side for future growth. Parking space is provided in front and on the side.

Inside the \$60,000 building, 2400 sq ft are devoted to the sheet metal shop, 1100 sq ft to the service section and 500 sq ft to the show-room and two offices. Although the display area is not large, it is beautifully paneled and well-lighted with spotlights to make the displays stand out. The offices are also paneled and attractively furnished. The display and office area is cooled in the summer and additional cooling will be provided for the shop next year.

The over-all effect is a very pleasant atmosphere for conducting business. "When customers come to call," Mr. Good said, "we want them to be impressed, particularly the other businessmen for whom we do much of our work. We want our place of business to express the same quality that we put into our installations. And we want



BOUQUETS from suppliers and friends welcome J. F. Cook, Jr. (left) and Ernest J. Good to new building



TASTEFULLY decorated office provides a pleasant atmosphere for conducting business

to give the impression that we expect to be in business a long time."

Hold Four-day Open House

To properly introduce the new building to its customers and prospects, Alpha held an informal open house over a four day period, Wednesday to Saturday. On Friday evening a special reception was held for suppliers, builders, architects, and contractors. Refreshments were served and small gifts passed out. A full page advertisement announcing the grand opening was run in Suburban Life, a newspaper serving many suburbs in the area.

The new building represents considerable progress for

"We want our place of business to express the same quality that we put into our installations"



EXTENSIVE insulated ductwork required for cooling 16-lane bowling alley (only partly shown here) is one reason why job was equal to many homes



EFFICIENCY was the keynote in the shop design, as is shown by this storage rack permitting easy selection of sheets

"Careful control over costs is the key to profitable operation for the dealer-contractor."

a firm established in 1954. Although the company started primarily in heating and sheet metal, it has since built up a large summer air conditioning volume, particularly in small commercial installations. As a result, its volume is now 50 percent in cooling, 25 percent sheet metal and 25 percent heating. Only 25 percent of its current business is residential and this is mostly in new custom-built homes. Future plans call for increased emphasis on residential heating modernization and industrial ventilating and air conditioning.

This shift in the company's business has been reflected in its name. Originally it was called Alpha Heating Corp. However, instead of adding the words "and Air Conditioning," which would have resulted in an awkward name, it was decided to shorten the name to Alpha, Inc. Mr. Cook and Mr. Good felt that the Alpha name was well enough established in the heating and air conditioning field to allow the change.

Many Types of Buildings Cooled

Alpha has air conditioned many types of small commercial buildings, including banks, drug stores, groceries and florists' shops. The largest job completed so far was a 16-lane bowling alley which required 32½ tons of cooling. The first 10 hp air cooled unit to be installed in the Chicago area was used to cool the cocktail lounge. Two 7½ hp air cooled units were used to cool the alleys and a third to cool the restaurant.

The development of the firm's commercial business was encouraged by the fact that a large number of stores and shops were being constructed in the area. Furthermore, few firms located in the immediate vicinity were handling this type of work. Mr. Good points out that the

bowling alley contract was the equivalent of 45 new house installations.

The company employs a sales engineer, four mechanics and six sheet metal journeymen. At present it operates four trucks but expects to purchase several more in the near future.

Sales promotion efforts by Alpha have utilized newspaper advertising, but the firm relies mostly upon direct mail. Manufacturer's literature is frequently used for mailings. A recent promotion piece was mailed to homeowners in the area to stimulate modernization sales and service work. It asked, "Wasting Fuel?" Then it answered, "Guessing costs you money . . . find out now without paying one cent for this expert service. Get our no-cost heating survey." A postage paid business reply card was included.

Careful Control of Costs Required

Careful control over costs is the key to profitable operation, Mr. Good believes. The dealer-contractor who knows his costs can estimate accurately and turn down the no-profit jobs. Good records and monthly statements help Alpha know where it stands at all times.

Another important factor in cost control is adequate facilities for shop work. Mr. Good says, "The dealer who tries to operate with a poorly equipped and crowded shop will soon be out of business. The waste of valuable labor time struggling with inadequate facilities will put his costs up too high to compete effectively."

Alpha has been well pleased with the response given its new quarters. They are confident that the new building is an investment which will pay off handsomely in the future.

NO STRANGER to American Artisan readers and the heating-cooling field, Guy Voorhees is one of the industry's outstanding authorities. For many years, he has been associated with NWAHACA, assisting in the preparation and presentation of educational programs, technical manuals and government and industry reports. Mr. Voorhees long has been in a position to keep abreast of latest developments, and his reports in this continuing series in American Artisan reflect these up-to-the-minute ideas.



Design Return Air System For the Job at Hand

Here's a review of the four basic types of return air systems, with recommended design procedures which round out carefully planned air distribution systems in various types of residences

FOR A SMALL DWELLING such as the bungalow we are considering in recent "classroom" articles these four types of return air systems, not necessarily in order of preference, might be used:

- 1) One return air duct only, from a centrally located first story room; no return from the basement.
- 2) One duct from the first story and one or more from the basement.
- 3) One return from each first

story room or group of rooms and one or more from the basement.

- 4) Any one of the above plus a fresh air intake.

Let's consider these types, in the order listed.

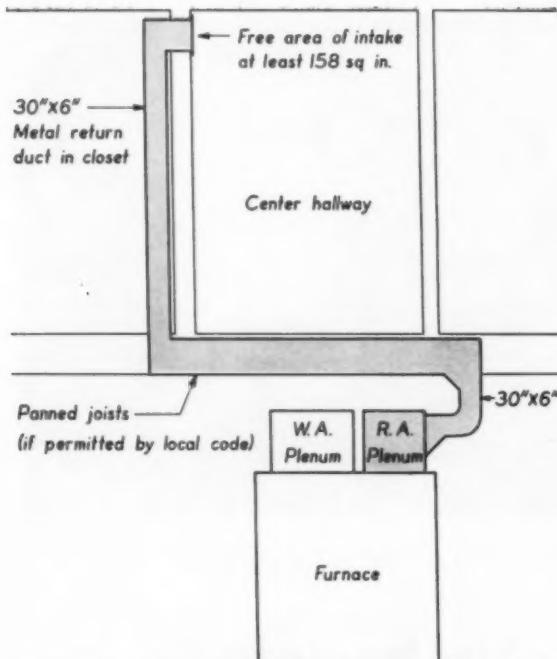
Single Return for Entire House . . .

. . . not recommended in design manuals

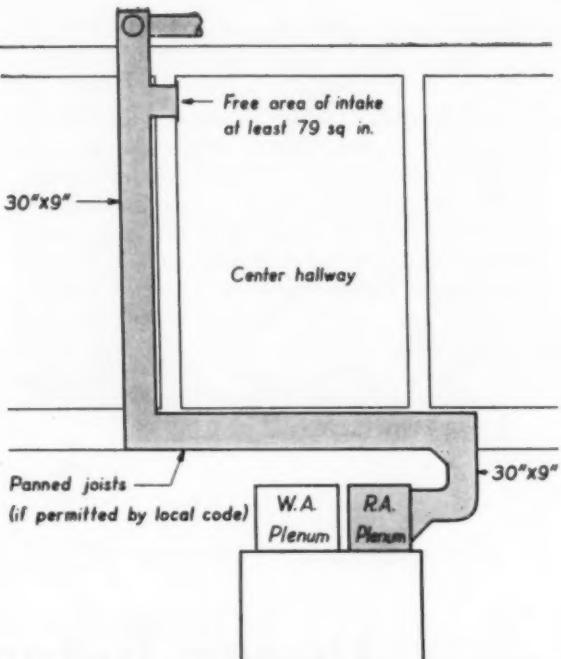
A single return from the entire house would be located at a convenient point in a first story room; probably in the living room or hallway. If the house had no door at the top

of the basement stairs and only a cased opening (without a door) between the kitchen and dining room, complete recirculation could be maintained. But even under these favor-

able conditions, this arrangement is not recommended in the design manuals of the National Warm Air Heating and Air Conditioning Association.



1 RETURN AIR DUCT for first story rooms makes four 90° deg turns. For given conditions grille should have 158 sq in. free area; duct should be at least 138 sq in., measure 30 × 6 in.



2 SEPARATE RETURNS for selected groups of rooms involves extension of downcomer to attic ducts. Larger duct and smaller free area of intake produce grille velocities within recommended range

TABLE 1—FREE AREA OF GRILLE may be selected from Return Air Grille and Duct Sizing Chart in NWAHACA Manual 4 (Fig. 79) for pressure drop allowance of 0.05 in. W.G.

Grill Free Area	No. of 90° Turns	UP TO 10 FT.						11 TO 20 FT.						21 TO 30 FT.						31 TO 40 FT.					
		Btuh.	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5
16	8,000	14	17	20	23	26	28	18	19	22	25	27	28	17	20	23	25	27	29	18	21	24	27	28	30
32	10,000	27	32	37	42	46	49	29	34	39	43	47	49	31	36	41	45	48	51	33	38	43	47	49	51
47	18,000	37	44	50	55	60	64	40	46	52	57	61	65	43	49	54	58	63	67	45	51	56	61	64	67
63	20,000	46	54	61	66	73	78	49	57	63	69	75	79	53	60	65	71	77	82	55	62	68	74	78	83
79	25,000	54	64	72	79	86	92	58	68	75	82	88	94	62	71	78	84	91	96	66	74	80	87	92	98
95	30,000	62	73	82	89	97	104	67	76	85	93	100	106	71	80	88	95	102	108	75	84	91	99	104	110
111	35,000	69	82	92	101	111	119	74	85	95	106	114	121	79	91	99	108	117	124	84	94	103	113	119	126
126	40,000	77	90	100	110	121	130	82	94	105	116	124	132	87	99	109	118	128	137	92	103	113	123	130	140
138	50,000	89	105	119	132	146	158	95	111	124	138	150	161	102	117	129	142	155	166	108	123	135	148	158	170
190	60,000	100	122	139	154	170	181	111	129	145	161	174	184	119	137	151	165	178	190	126	143	158	172	181	193
221	70,000	117	139	158	174	191	203	127	147	164	182	195	206	135	155	171	186	200	213	144	162	178	193	203	216
252	80,000	128	155	175	191	208	222	140	164	182	198	214	225	151	172	188	203	219	231	160	179	195	211	222	235
284	90,000	141	168	188	206	225	244	152	177	195	213	232	248	164	186	201	218	240	256	173	193	208	229	244	262
316	100,000	154	180	200	221	247	265	166	189	209	233	252	270	176	198	217	239	258	277	185	206	227	250	265	285

Central Returns for Basement, Upstairs . . .

. . . acceptable for small house with heated basement

One return from the first story and at least one from the basement is listed in NWAHACA Manual 4 as acceptable for a small house with a

heated basement. If the basement is divided into several heated rooms a return from each basement room is recommended. When the entire base-

ment of a small house is one undivided room such as in our problem house, many dealer-contractors prefer one centrally located return. With

ceiling diffusers or high side wall registers, they prefer to locate return air intakes near the floor. But with perimeter warm air outlets near the floor such as we are using in our problem house, high returns seem completely satisfactory. Regarding returns from first story rooms, the current edition of Manual 4 states: "A single return grille directly connected to the furnace will often give satisfactory results in smaller structures. . . In larger structures a return air system should be installed with return air grilles in most rooms."

TABLE 2—RECOMMENDED VELOCITIES AND FREE AREAS of grilles are based on cfm delivery of supply air to room

Warm air delivery to room, cfm	Air velocity through wall grille				
	150 fpm	175 fpm	200 fpm	250 fpm	300 fpm
50.....	48.....	41.....	36.....	29.....	24.....
75.....	72.....	62.....	54.....	43.....	36.....
100.....	96.....	82.....	72.....	58.....	48.....
125.....	120.....	103.....	90.....	72.....	60.....
150.....	144.....	123.....	108.....	86.....	72.....
175.....	168.....	144.....	126.....	101.....	84.....
200.....	192.....	164.....	144.....	115.....	96.....
225.....	216.....	185.....	162.....	130.....	108.....
250.....	240.....	205.....	180.....	144.....	120.....
275.....	264.....	226.....	198.....	158.....	132.....
300.....	288.....	246.....	216.....	173.....	144.....
350.....	336.....	287.....	252.....	202.....	168.....
400.....	384.....	328.....	288.....	230.....	192.....

Separate Return for Each Room and Basement . . .

. . . assures satisfactory results

Many dealer-contractors who insist on installing only the very best air distribution systems will settle for no less than one return from each first story room or group of rooms and one or more from the basement. They prefer a return air grille in each bedroom connected directly to the return air plenum; also one from the living room or small hallway to handle return air from living room, dining room and bath. Many also insist on a return air duct from the kitchen, although a few hold that a kitchen return may spread cooking odors and moisture throughout the house.

But consider this: Last month's "classroom" article established the air delivering capacity of the duct to the kitchen at 122 cfm. Because of heat generated when meals are being cooked, the housewife probably closes the kitchen diffuser partially, to reduce heat delivery. The resulting air delivery is 60 cfm. For each cu ft of air delivered to the kitchen, an equivalent volume of kitchen air must escape.

If the kitchen and dining room are joined by a doorless cased opening or an open door, about 60 cu ft of kitchen air (including odors and moisture) flow through this opening into the dining room every minute. If a kitchen ventilating fan is turned on as soon as cooking starts, it may

easily exhaust enough kitchen air so the air flow through the diffuser is not restricted. But in the average home the ventilating fan is seldom turned on soon enough or allowed to run long enough to insure complete removal of cooking odors. In other words, cooking odors usually spread through the house to some extent regardless of ventilating fans or kitchen vent flues. And since these odors spread through the other rooms anyway, there seems to be no sound reason for not installing a return air intake in the kitchen.

Wall Grilles Connect Rooms

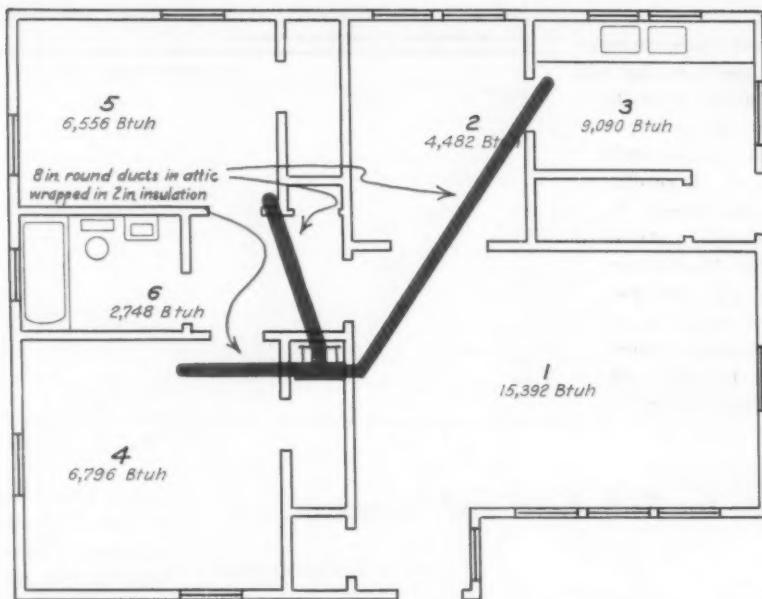
For a bedroom, kitchen or other room which does not have a return air opening connected directly to a return duct, Manual 4 recommends a grille in the partition separating the room from one which does have a return air intake. But the manual doesn't say definitely what size (free area) of grille is needed. It is commonly assumed that the free area of the grille may be selected from the Return Air Grille and Duct Sizing Chart in the manual. (See Table 1.)

But some careful designers object that the free areas shown in the table apply to a grille directly connected to a return air duct sized for a suction pressure of 0.05 in. W.G. on the return side of the system. They argue

that to allow room air to escape freely from a grille in a kitchen, bedroom or any other room which doesn't have its own return air opening directly connected to the duct system, the air velocity should be somewhat less; consequently, the free area of the grille should be greater than that recommended in the table.

Classroom discussions on this subject invariably expose a wide variation in opinion as to the preferred air velocity through such a grille. Most dealer-contractors agree, however, that when the supply air delivery through the diffusers in a given room is less than 100 cfm the preferred velocity through the wall grille should be comparatively low—probably about 150 or 175 fpm. Where warm air deliveries must be 250 to 300 cfm, some designers are willing to have velocities through the wall grilles as high as 300 fpm. Obviously, the decision of the designer is largely a matter of personal preference based on his own observation and experience. Table 2, based on cfm delivery to a room, may be helpful.

Manual 4 doesn't include a table like Table 2 on these pages, nor does it recommend sizes of wall grilles, principally because no generally accepted velocity through such a grille can be considered "best." As previously mentioned, this has been largely a matter of personal preference. NWAHACA manuals, like city building codes, represent minimum requirements which can usually be exceeded in the interest of improved quality.



3 GRILLE IN CENTRAL HALLWAY handles return air from rooms 1, 2 and 6. Separate attic ducts from ceiling diffusers to same downcomer serve rooms 3, 4 and 5

Fresh Air Intake with Any Return Arrangement . . .

. . . provides combustion, ventilation air in "tight" houses

To any of the three return air arrangements can be added a fresh air intake to provide ventilation and combustion air in a tightly built house. This important subject will be discussed in a future "classroom" article.

Use Recommended Capacities

Let's assume for our current problem that the kitchen and dining room are separated by a door. We need a grille in the wall between these rooms; also a grille in each bedroom to allow room air to escape when the door is closed. The return air intake for the first floor rooms will be in the center hallway. If we size the wall grilles according to the cfm capacities of supply ducts to the rooms which have air outlet grilles, these capacities (from September American Artisan) will be used. (Assume an air velocity through each grille of about 175 fpm as recommended previously.)

Room	cfm	Wall grille free area
No. 3—Kitchen	122	103 sq in.
No. 4—Front Bedroom	97	82 sq in.
No. 5—Rear Bedroom	97	82 sq in.

The total heat loss of the first story rooms, as established in March American Artisan, is 45,000 Btu/h. As shown in Fig. 1, the return air makes four 90 deg turns in the duct, which is about 16 ft long. From Table 1 we see that the minimum grille size should have 158 sq in. of free area and the minimum duct size should be 138 sq in. From a table of rectangular equivalents of round ducts in Manual 4, we find that the metal duct may be 30×6 in. Unless the local building code forbids, the air may be carried part way between the joists, using two joist spaces as shown in Fig. 1.

Rooms Have Separate Returns

Now suppose we decide on a separate ducted return from each room or

group of rooms. A grille in the central hallway can handle return air from rooms 1, 2 and 6 (Fig. 3) and separate attic ducts will run from ceiling diffusers in rooms 3, 4 and 5 and connect to the same downcomer duct (Figs. 2 and 3).

Table 3 is a compilation of duct and grille free areas according to Manual 4.

Table 3 shows the total downcomer duct area to be 229 sq in., which is assumed to be the cross sectional area of a round duct. The manual shows that any of the following rectangular ducts will carry the air with the same frictional resistance as a round duct having 229 sq in. of area: 30×9 in., 26×10 in., 21×12 in. or 18×14 in. When we get to the basement it is convenient to pan joist spaces as shown in Fig. 2.

Velocity Less in Larger Trunk

Note that the downcomer duct in the closet and the metal duct in the

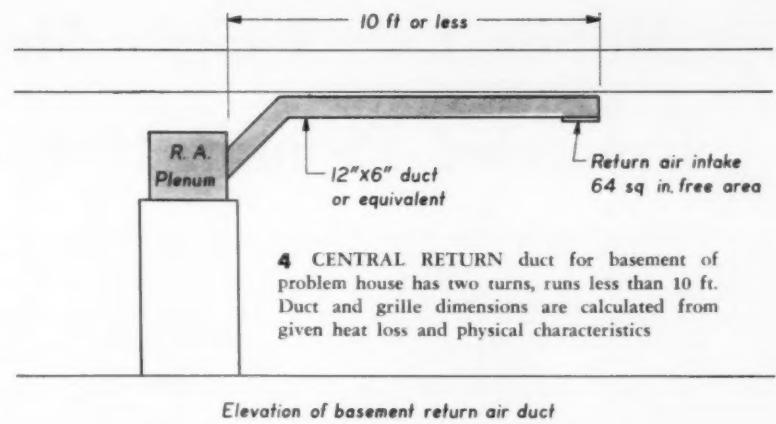
basement have 50 percent greater cross sectional area when the two bedrooms and the kitchen have return air intake grilles with ducts connecting them to the main return air trunk than when all first story return air is taken through one intake in the hall. With the same air volume handled in each case, the velocity is only two-thirds as great in the larger trunk as in the smaller one. This is to keep the total friction pressure loss equal to about 0.05 in. W.G. When we size return air ducts according to Manual 4, we're using an approximate method for the sake of simplicity. For larger houses, designers can use the more precise method based on friction pressure loss to size the return air duct system according to Manual 9.

Keep Intakes Away from Unit

Some local codes prohibit taking return air from the room in which the furnace is located. Such a code provision is supposed to keep the suction of the blower from "fighting the chimney draft," interfering with combustion, and in extreme cases, pulling combustion products out into the circulated air. This is a wise safety precaution when a furnace is installed in a small, tightly built room. But the way the provision is worded in some codes, a building inspector might easily misinterpret it to mean that in a residence like our problem house where the entire basement is one large room, we could not take any return air from the basement.

Codes Specify Distance

Other codes insist that intakes be a specified distance (from 5 to 20 ft) away from the furnace. The idea is to keep the return air intake far



Elevation of basement return air duct

4 CENTRAL RETURN duct for basement of problem house has two turns, runs less than 10 ft. Duct and grille dimensions are calculated from given heat loss and physical characteristics

enough away from the draft diverter on a gas-fired furnace, or the barometric damper on an oil-fired furnace, that the suction at the intake will neither interfere with proper combustion nor pull combustion products out into the circulating air.

Use Tables, Charts for Sizing

Suppose we decide to provide one centrally located return air grille near the ceiling in our problem house. Fig. 4 shows one such return near the foot of the stairway. The air stream makes one 90 deg turn as soon as it enters the intake grille and one 45 deg turn where the duct angles down to the return air plenum. The length of the duct will be not more than 10 ft and the sizing chart shows that for the basement, which has a calculated heat loss of 25,000 Btu/h, the free area of the grille should be 79 sq in. The capacity table shows duct free areas on the basis of Btu/h, length and number of 90 deg turns. We would call the 45 deg turn an elbow. Our basement return duct has a length of not more than 10 ft with two 90 deg turns; for 25,000 Btu/h it shows a required duct free area of 64 sq in.

According to the manual table of equivalent duct sizes, we would specify a duct 12 X 6 in.

Bring in Fresh Air

In the northern states and Canada where houses are more tightly built, many dealer-contractors believe that an air intake should be installed to bring air in from outside to insure ample combustion air for the burner. But if the house is so tightly built that combustion air must be brought in, additional volume is usually required for proper ventilation and occasional removal of excess moisture and odors.

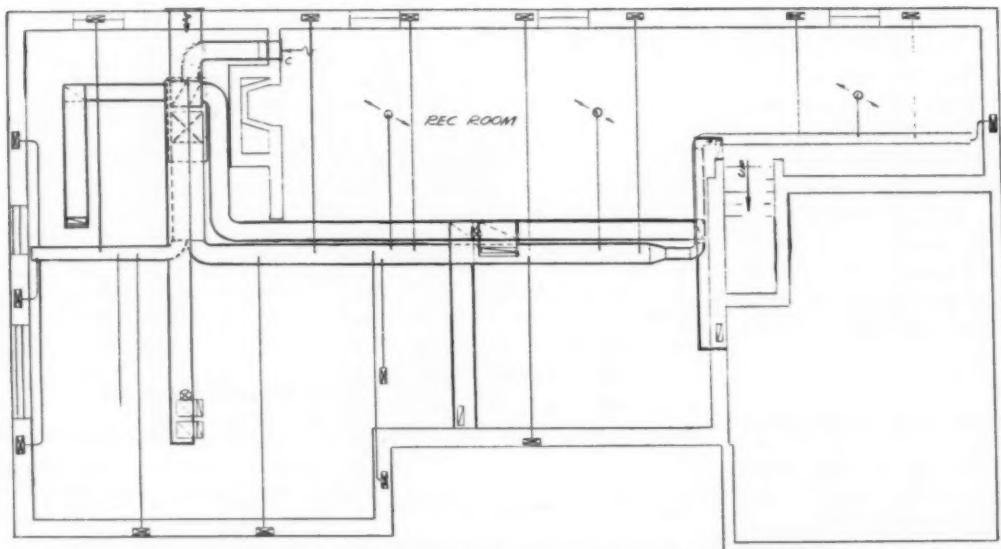
Adds to Fuel Cost

Engineers used to believe that air brought into the house through a fresh air intake would not increase the amount of heat required from the furnace, on the theory that the blower would build up the air pressure inside the house and thus reduce the volume of air which would normally enter by infiltration through window and door cracks on the windward side of the building. Extensive research sponsored by National Warm Air Heating and Air Conditioning Association at the University of Illinois analyzed effects of introducing outdoor air through such a fresh air intake. The results showed that this added introduction of outside air definitely added to fuel cost. This will be considered in detail in a future article of this series.

TABLE 3—DUCT AND GRILLE free areas for problem house are selected from NWAHACA Manual 4 from known heat loss and duct characteristics

Room or rooms served	Calculated heat loss (Btu/h)	Length from intake to return air plenum	No. of 90 deg turns in duct	Minimum free area
1, 2, 6	22,622	.19 ft	4	.79 .82
3	9090	.37 ft	6	.32 .51
4	6796	.22 ft	5	.32 .48
5	6556	.28 ft	5	.32 .48
Total duct area				.229

Mobile Lab Weighs Merits of an Extended Plenum Heating System



EXTENDED PLENUM SYSTEM supplies 16 baseboard diffusers on first floor, three ceiling diffusers in basement. Seven intakes upstairs and one in basement handle return air. Outdoor air intake is controlled manually

Four extended plenums feed sixteen small branch ducts to perimeter baseboard registers in frame house where high humidity, drafts, dirt and uneven temperatures were reported. Here are the findings and recommendations for adjustment

DEVELOPMENT OF AIR distribution systems to provide better temperature distribution between floor and ceiling of a room and between rooms is the consistent objective of industry engineers and the National Warm Air Heating and Air Conditioning Association. To obtain reliable data on the use of small diameter duct systems in cold climates and the extent bypass and zone control systems have in reaching the objec-

tives, the field investigation committee of NWAHACA tested six such installations. The committee's findings are summarized here.

This article describes an extended plenum duct system feeding sixteen 4 in. diameter ducts, each leading to a warm air baseboard register at the perimeter of the house. Four extended plenum sizes are used: a 4½ ft length of 24 × 8 in. duct furnishes warm air to a 9 ft length of 12 × 8

in. duct, a 27 ft. section of 18 × 8 in. duct, and finally to a 10 × 18 in. duct which extends 24 ft. All baseboard registers are 12 × 6 in. except the one in the main entry which is 10 × 6 in. Seven return air intakes are located in the baseboards of the inside walls of the house. One return air intake and three ceiling supply diffusers are located in the basement.

The house is a well-built, one-story, wood frame and siding house with a

full basement. The roof is flat and allows no attic space. The house was erected in 1952 for \$18,000 including the attached garage and land.

Outside walls are $\frac{3}{4}$ in. cedar siding over building paper and plywood sheathing. Mineral wool insulation batts in side walls are 4 in. thick. Interior walls and ceilings are rock lath and plaster. Foil type insulation barrier is placed under the ceiling insulation; in addition, $\frac{1}{2}$ in. insulation board is inserted just under the roofing material. The flat roof covering consists of felt roofing paper, white pea gravel and tar.

All windows on the first floor, except the four 40×66 in., sealed, double glass picture window panes in the living room, are wood sash, double hung. All windows have storm sash and weatherstripping. The three outside entry doors are wood. Each has storm doors and weatherstripping. Conventional basement windows are used on the north side. Those on the west side are 8 in. glass block.

Design Conditions Described

Design heat loss for the first floor rooms is 57,127 Btu/h. For the basement it is 21,898 Btu/h. Total heat loss then is 79,025 Btu/h. For the first story area of 1387 sq ft, the design heat loss amounts to 41.2 Btu/h per sq ft of floor area. The design temperature is -20 F. Degree days averaged about 8500 for the year.

The extended plenum system is well designed, well installed. The 180 ft exposed wall has 16 baseboard warm air registers. Average distance between registers is approximately $11\frac{1}{4}$ ft. Three 6 in. round diffusers supply warm air to the basement. The three bedrooms and the kitchen each have a 12×6 in. return air intake. The entry hall and family room each have a 14×6 in. intake. The living room has a 30×6 in. return. One return is located near the basement fireplace. The oil-fired furnace has a 1.00 gph gun burner and a bonnet rating of 112,000 Btu/h.

All first floor warm air supplies are perimeter diffusers consisting of a projecting plate with a slot around it, discharging a thin stream of air

TABLE 1 — ROOM AIR TEMPERATURE DIFFERENTIALS in first floor rooms averaged 4 deg from ceiling to floor when outdoor temperature was 15 F and the thermostat setting was 73 F. Sun intensity was about 90 percent of maximum and wind velocity was 5 to 8 mph

Room	Living Room	Den	Kitchen	Bedroom #3	Bedroom #2	Bedroom #1	Average
3 in. below ceiling	76.7	73.3	78.5	73.0	72.5	73.4	74.6
30 in. level	74.6	71.7	75.8	72.1	71.3	71.5	72.8
3 in. above floor	73.3	67.8	72.0	70.4	71.0	69.2	70.6
Differentials between levels							
Ceiling-floor	3.4	5.3	6.5	2.6	1.5	4.2	4.0
30 in. level-floor	1.3	3.9	3.8	1.7	0.3	2.3	2.2
Floor surface	74.1	71.8	72.4	70.4	72.6	72.7	72.3
Floor air to floor surface	-0.8	-4.0	-0.4	0.0	-1.6	-3.5	-1.7
Temperatures in deg F							

TABLE 2 — BASEMENT AIR temperature differentials range up to 13.9 deg from floor to ceiling under same conditions as Table 1. Floor surfaces were warmer than air directly above them

Room	East Recreation Rm	Middle Recreation Rm	West Recreation Rm	Average
3 in. below ceiling	78.3	74.4	76.3	76.3
30 in. level	68.8	67.6	68.7	68.4
3 in. level (floor)	64.4	65.6	65.3	65.1
Differentials between levels				
Ceiling-floor	13.9	8.8	11.0	11.2
30 in. level-floor	4.4	2.0	3.4	3.3
Floor surface	65.7	67.5	66.8	66.6
Floor air to floor surface	-1.3	-1.9	-1.5	-1.6
Temperatures in deg F				

TABLE 3 — FLOOR SURFACE TEMPERATURES in exposed corners of first floor rooms were 4 to 7 deg cooler than in centers of rooms. Basement surface temperatures were more uniform. Conditions were same as Table 1

Room	Floor surface temperatures, deg F		
	Center of Room	Exposed Corner	Exposed Wall
<u>First Floor</u>			
Living Room	74.1	—	68.0
Den	71.8	68.4	—
Kitchen	72.4	—	—
Bedroom #3	70.4	64.2	—
Bedroom #2	72.6	65.8	—
Bedroom #1	72.7	65.6	—
Bathroom	—	—	70.6
<u>Basement</u>			
Recreation Room, East	65.7	—	62.4
Recreation Room, West	67.5	—	64.7
Basement, South	66.8	—	62.0
Temperatures in deg F			

parallel to the wall. The single exception is a standard 10×6 in. baseboard diffuser in the entry. All registers are in the baseboard or wall near the floor; most are under windows.

Outside Air Supplied

A 12×8 in. outdoor air intake on the north side of the house slightly above the grade level is connected to the return air side of the furnace. The outdoor air flow rate into the furnace is controlled by a manually-operated damper in the duct.

This system has the conventional oil burner primary control, room thermostat, and a combination fan and limit control.

The control settings used at the time of the test were:

Thermostat settings (changed manually): 73 F during the day; 70 F at night.

Fan switch: on at 150 F; off at 110 F.

Limit control: off at 200 F; differential 25 deg.

Barometric damper: 7 in. dia.

The owner reported consumption of 1400 gal. of oil between September 1953 and May 1954.

Temperatures Low, Range 16 F

The weather was fairly constant during the four day test period from December 27 to December 31, 1954. The minimum outdoor temperature was about 7 F; maximum was 23 F. The sky was usually overcast and snow threatened. On December 29,

THIS IS THE THIRD in a series of six articles on extended plenum, small duct heating systems using zone control or bypass arrangements

when most of the room data was recorded, the temperature outdoors ranged from 7 to 23 F.

No adjustments were made prior to the start of the test.

The house is occupied by a young couple with three children: one under six, one between six and twelve, and one over 12. They were most unhappy with the heating of their home. When asked what they liked about it, they said "nothing." They complained of "cold 70," too much dirt, frequent discomfort, and excessive drafts.

Furniture Blocks Registers

Furniture placement may have contributed to their discomfort, even though the perimeter registers discharge a thin stream of air upwards into the room. For example, one bed and its coverings practically covered the register face. The same was true to a lesser degree in the living room where a chest was placed directly in front of a register. A large sofa was in front of the return air register in the living room, and while the furniture did not interfere with the functioning of the intake, air movement at the floor in front of it could be felt by persons seated on the sofa.

High Humidities Explained

The family washing was dried indoors by an unvented clothes drier. Lingerie, etc. was also dried indoors. This fact may explain some of the high humidity in the house.

Indoor relative humidities near 30 percent were recorded. This is high when outdoor temperatures average about 14 F. This raises the question of what the relative humidity might have been if about 15 percent outdoor air had not been introduced into the house through the heating system. No trouble was experienced with window condensation.

An 8 in. kitchen ventilating fan is used approximately 45 minutes per

day. The fireplaces have chimney dampers that are closed except when the fireplace is used.

Table 1 summarizes first floor room air temperatures and temperature differentials recorded when the temperature outside was 15 F and the thermostat setting was 73 F.

Vertical Differentials Fair

A room air temperature differential of 4.0 deg from floor to ceiling amounts to 0.70 deg per 10 deg change in indoor-outdoor temperature difference. Similarly, the temperature differential of 2.2 deg from floor to sitting level amounted to 0.38 deg per 10 deg change in indoor-outdoor temperature difference. Neither value is considered too large.

The floor surface was found to be generally warmer than the air immediately above the floor.

Table 2 summarizes recorded basement room air temperature and temperature differentials found when outside air was 15 F and the thermostat setting was 73 F.

Basement Air Variation High

The temperature differentials between the basement floor and the ceiling were high, ranging from 8.8 to 13.9 deg, with most of the differential between the 30 in. level and the ceiling. In every instance the basement floor surface temperatures were warmer than the room air immediately above them.

A close representation of true air flow rate is often given by return air velocity readings or calculated air volume based on a formula utilizing the furnace heat balance. The latter procedure is unreliable unless the oil flow rate is accurately measured. No accurate figure can be obtained by relying upon the gph rating of the nozzle in this case.

Air flow rates as calculated by supply air register measurement (539 cfm), return air register measurement (690 cfm), and furnace heat

balance (605 cfm) are close enough for a fairly clear picture, and 605 cfm appears to be a reasonable approximation. Approximately 13 percent of the total volume consists of outdoor air supplied to the house.

Temperature Drops In Ducts

The range of register air temperature during a cycle of burner operation averaged about 30 deg, which is a substantial variation and one not likely to produce good room air temperature control. Some of the low register air temperatures reflect considerable temperature drop in the ducts. This adversely affects the room air temperature levels in some of the rooms.

Table 3 is a summary of floor surface temperatures recorded when outdoor air temperature was 15 F and the thermostat setting was 73 F.

The floor surface temperatures in the centers of the first floor rooms were usually higher than the room air at the floor level. In exposed corners the surface temperatures were from 4 to 7 deg cooler than those in the centers of the rooms. The recreation room was the only heated area in the basement; however, the basement floor surface temperatures were fairly uniform in the centers of all the rooms as well as along the outside walls.

North Walls, Glass Tested

Observations of wall and glass surface temperatures were confined to the first floor rooms. Two windows and one wall surface were selected, all on the north side of the house, and all exposed to the same outdoor temperatures and wind exposure.

Bedroom 1 has a double hung window equipped with storm sash and weatherstripping, and a fixed window with a double glass, sealed window pane, with no storm sash. The wall area selected was about 30 in. from the floor on the north wall

of bedroom 1, and near the outside corner of the room. It has a heat transmission factor of 0.09 Btu/h per sq ft. Construction is the same as the rest of the house.

Surface temperatures of walls reflect the effectiveness of wall construction with respect to insulation and weatherproofing. In this instance the wall surface temperature increased about 2½ deg during the day.

Storm Sash vs. Double Pane

The temperature of the glass surface in the bedroom window increased 9 deg. The glass surface of the window in the living room increased 7 deg. Each window is above a warm air diffuser, and both might have been subject to some indirect sun radiation from the snow-covered earth outdoors. The average temperature of the glass surface of the double hung window with storm sash was higher than that of the sealed, double glass pane in the living room. Both windows were subject to the same outdoor temperature, sun exposure, and wind conditions.

The room-to-room temperature balance on the first floor was a maximum of 4.1 deg; however, the range of room air temperatures between burner cycles varies from 2 to 7 deg.

Bedrooms 2 and 3 located on the south side of the house showed the effect of solar heat gain during the early afternoon when air temperatures at the 30 in. level reached a maximum of 79 F in bedroom 3 and 79.5 in bedroom 2.

Data obtained on burner operation showed that the flue loss was high, primarily because of the high flue gas temperature. There does not appear to be an excessive fuel oil consumption for the house, indicating that the overall house heating efficiency was considerably higher than the estimated bonnet efficiency of 60.5 percent.

The estimated reserve of fuel input to the burner would be about 31 percent on a design day. This is larger than necessary and indicates that a slight reduction of fuel input rate could be made. The oil nozzle in use

FIELD TESTS SEEK SUGGESTIONS FOR IMPROVED HEATING PRACTICES

The National Warm Air Heating and Air Conditioning Association maintains a mobile laboratory which moves into an area and surveys heating and cooling equipment installed in residences. No effort is made to alter any of the conditions found. Data is secured by the mobile laboratory technician and turned over to the

Engineering Advisory Council for evaluation. This series of articles summarizes reports on six extended plenum heating systems, four with face and bypass damper arrangements to shunt air around the furnace heat exchanger, and two that use zone control. Small diameter ducts are used as feeders in all six jobs.

was rated at 1.0 gph. The next smaller size should be adequate.

Based on an estimated air flow rate through the house of about 605 cfm, the rate of air recirculation was about 3.1 per hour. This is not out of line with experience on other installations with small duct systems.

CAC Would Improve Comfort

Data obtained on length of burner firing periods and blower operating time, when the outdoor temperature was about 12 F, indicated there were four burner operations of about six minutes each and about eight minutes between burner cycles. The bonnet temperatures ranged from 115 to 168 F which in turn resulted in a 30 deg variation in register air temperatures. Blower operation averaged 10 minutes per cycle with four cycles per hour. Each cycle was followed by a four minute off period.

Each of these operations is reflected in the room air temperatures. At 30 in. above the floor in the living room, temperatures varied about 3 deg during a burner cycle. The temperature of the return air from the living room varied about 4 deg. Many of these temperature variations would have been greatly reduced had the system been adjusted for continuous air circulation. Large varia-

tions in bonnet, register and room air temperatures are, of course, related.

Even though outdoor air temperature was 12 F at the time of the tests, the blower operated only about 69 percent of the time, and an extrapolation of the blower data showed that continuous operation would not have been obtained until the outdoor temperature dropped to -11 F. During the 4 minute off periods of the blower the room air temperature dropped about 3 deg. The first air delivered from the registers when the blower started again was cold. The system was clearly out of adjustment and the complaints of the occupants appear to be justified.

Static Pressures Within Limits

A total duct static pressure of 0.17 in. for an air flow rate about 20 percent lower than usual design values is not out of line. In fact, if sufficient air flow had been maintained to provide a 100 deg temperature rise through the furnace the static pressure would have been about 0.24 in. w.g. The 0.04 in. pressure loss on the return air side is low, and not unexpected because of the extensive return duct system.

Another small duct extended plenum system will be discussed next month.

Dealer-Contractor Wins Leads In 'Oldest Furnace' Contest

**Newspaper contest to find the
oldest furnace in his market area
brought in more leads at a
lower cost per prospect than any other
promotion activity he's ever used**

THE MOST SUCCESSFUL modernization promotion ventures are those which yield the most productive leads per dollar invested. One of the most fruitful promotions conducted by Mitchell Sales Co., Montclair, N. J. was a contest to locate the oldest furnace in the area served by the firm. President W. M. Rile says this type of promotion figures to develop the best modernization leads because it is restricted to owners of the oldest equipment in town and turns up the heating systems which are operating least efficiently and providing the least comfort. It's not too difficult, this firm has found, to convince the owner of such a system that money spent in heating modernization will bring him more comfort and service than a similar amount invested in any other type of modernization work.

Follow-Through Is Vital

Most dealer-contractors have found that such a contest must include a thorough follow-through program to

be successful. This phase of the Mitchell program was assigned to salesman P. J. McElwee, whose system of converting contestants into prospects and finally into customers is worthy of consideration by other firms which contemplate similar programs.

The contest ran four weeks, from October 10 to November 6. Fifty insertions were made in 10 local newspapers. Most ads were two columns wide, 10 in. deep. Under a large headline introducing the contest, copy urged the home owner to identify the type of system installed in his home, its approximate age, and the type of fuel it used on a coupon-entry form at the bottom of the ad.

Ads Explain Rules

The newspaper ads also listed the rules of the contest and explained that each heating system entered must be in a building owned by the contestant. The prize—a complete new heating unit with a value of ap-

proximately \$500 retail—was offered to the contestant who could prove his was the oldest heating system in the area. The rules pointed out that installation and modification work was not included and that no cash substitution could be made for the new furnace offered as the prize.

To keep interest alive through the four-week period, alternate ads were published under the heading "No Winner Yet." The rules of the contest were reviewed in each ad and readers were urged to enter their central heating systems in the contest by filling in the coupons.

Seventy-five contestants mailed in coupons. On November 26 the winner's name was announced in an ad which was the same size as previous insertions. In addition to the winner's name and address, the ad included a photograph of the furnace he had won.

Free Publicity Fans Interest

Editorial publicity in the same newspaper helped promote interest. A news item with a two column headline and 15 in. of type publicized the contest and described the winning entry as well as other furnaces entered in the contest. The article also included some background information

**Salesman's calls on entrants to verify contest information
open the door to future heating modernization leads**

on the winner's family and personal history.

Consolation Letter Sells Ideas

Contestants whose heating systems did not win received consolation letters from the Mitchell Sales Co. The message expressed appreciation for the contestant's participation in the contest. The "thank you" letter eased into an explanation of why an old heating system needs replacement, and the recommendation that the contestant consider replacing his existing heating equipment to gain the benefits of modern manufacturing techniques and engineering which now provide more economical comfort during the winter.

The contest uncovered about 40 furnaces which were at least 30 years old. The winning furnace was over 80 years old.

Visits Serve Two Purposes

During the contest, P. J. McElwee called on each contestant to verify the information given in his entry, and photographed each heating plant with a Polaroid camera. This service helped him establish a personal relationship with the prospect, and has

HERE'S HOW THE OLDEST FURNACE CONTEST PAID OFF FOR THIS DEALER-CONTRACTOR

1 Four sales were made and 11 additional bids had been submitted before the contest ended.

2 Local newspapers were intrigued by the novel contest and published excellent additional editorial support.

3 The company developed more than 70 extremely good prospects for modernization.

4 The contest stirred up interest in the community. Many people who had never previously heard of Mitchell Sales Co. became acquainted with the firm and the type of service and equipment it offers.

proved very fruitful in following up prospects to convert them into customers.

Mr. Rile says the contest developed more prospects at a lower cost per prospect than any other advertising activity his company has ever undertaken.

A procedure outline for conducting the oldest furnace contest and tie-in materials were supplied to Mr. Rile by Thatcher Furnace Co. which reports that many other dealer-contractors have successfully used the program to develop leads and increase sales.

HOW TO WRITE BETTER LETTERS

EVERY TIME YOU WRITE a letter you paint a portrait of yourself, observes Gilbert Faye, editor of the New York State Roofing and Sheet Metal Crafts Institute, Inc., in an article in the monthly Institute Ticker. He gives two basic rules for writing successful business and sales letters: 1) Don't use needless words, and 2) Get to the point.

The article presents a nine-point check-list for writing letters which will be read and absorbed:

1) *Do you start punching right off?* Begin the letter with the point you want to make. Don't dance on your toes first with worn-out introductions.

2) *Is each sentence short enough to read comfortably in one normal breath?* If not, break it up. A liberal sprinkling of periods and paragraphs puts spice in your letter writing.

3) *Do you use overworked phrases?* Be leery of words which run in packs. Don't say "prior to" when you mean "before," "in the event that," when you mean "if," etc. Most of these phrases have one-word substitutes.

4) *Do you steer clear of the awkward "the . . . of" construction?* Don't write "the installing of duct work"

when you can say it better and in fewer words as "installing duct work."

5) *Do you use simple sentences?* The soundest sentence structure ever developed is the straight subject-verb-object order. Qualifying clauses and parallel ideas are easier to absorb in separate simple sentences.

6) *Have you told everything necessary?* Put yourself in the reader's place. Did you tell him all he needed to know? Did you answer his questions completely?

7) *Have you cut out everything unnecessary?* Again, from the reader's standpoint, is there anything in the letter he already knows or doesn't need to know? If, so, take it out.

8) *Have you talked in friendly, personal tones?* If your letter is couched in terms of "you" and "I"—without too much "I"—you're probably on the right track. But if you refer to yourself or your reader in the third person you're too formal.

9) *Have you used words you would use over the telephone?* Beware of the legalistic-flavored words such as "party" for "person," "secure" for "get," "numerous" for "many," and other affected terms.

Curtain Wall Job Opens Twice As Many Classrooms



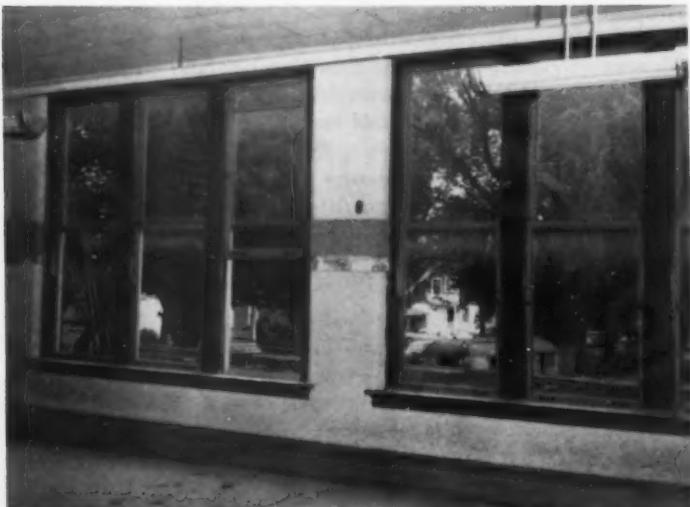
SATIN FINISHED galvanized sheets, pre-formed into attractive pattern, make up exterior panels for curtain walled school annex which was completed during three month summer vacation, doubling the number of classrooms at a saving in time and cost over other types of construction

IN MANY COMMUNITIES where school facilities are inadequate for increasing numbers of school-age children, the bottleneck is in the number of classrooms available even though land and other facilities may be adequate. This was the case at the Friedens Evangelical Lutheran Congregational school at Kenosha, Wis. The original building, erected in 1908, was two stories high and contained eight rooms, one of which had been converted to administrative operations.

Time Limit Is Rigid

With the growth in community population came the need for eight more classrooms. But construction had to be delayed until school was dismissed for the summer, and all erection and modification of the existing building had to be completed by the time classes convened in the fall.

Existing school was remodeled wherever possible to harmonize with new annex

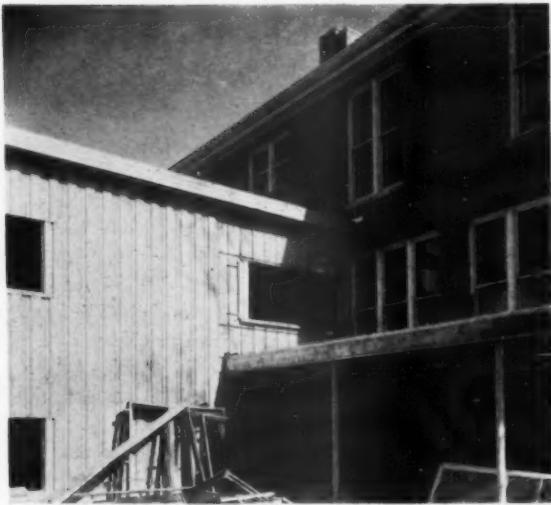


OLD STYLE WINDOWS in existing school building, typical of 1903 architecture, were . . .

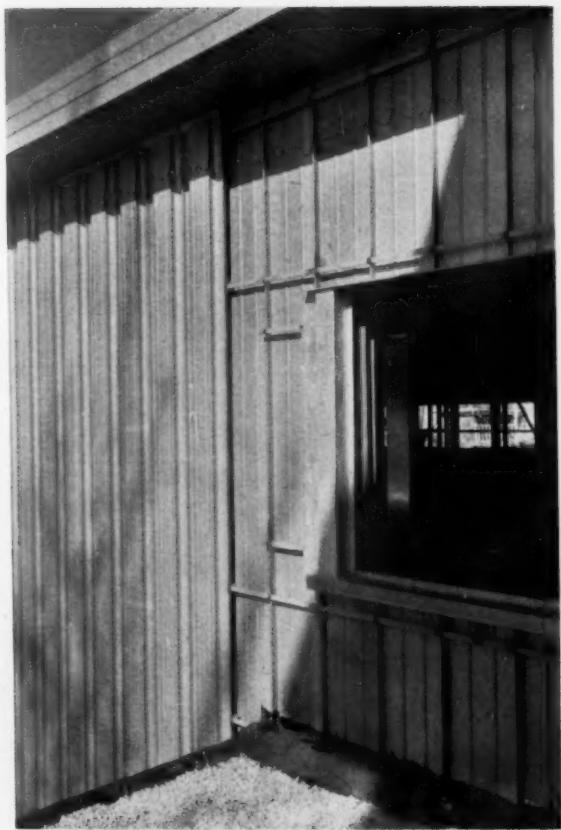


. . . torn out and framed with lightweight metal studs and . . .

Prefabricated panel components were at the job site the last day of school and a brand new annex was waiting when the bell rang in the fall



NEW AND OLD styles of architecture combine to provide adequate number of classrooms (eight each). New building is streamlined in both construction and architectural details



COMPLETED EXTERIOR WALL (left) covers inside panel sheet and horizontal retaining straps welded to inside panel seams, which will support insulation to be added



. . . partially closed in with backup sheet for curtain wall panel which is . . .



. . . insulated and covered with satin finished galvanized outer panel to match new building exterior



LIGHTWEIGHT FRAME for interior and exterior walls cut construction time for two-story structure annexed to 50-year-old building

This time factor ruled out the possibility of using matching masonry construction and favored metal curtain wall panels for the annex. To make the existing building conform architecturally to the new annex, the oversize windows were altered to modern dimensions and the closed areas were sheathed by the same type of curtain wall panels used on the new structure.

Metal Panels Cut Costs

Use of the lightweight framing and curtain wall panels reduced foundation costs 20 percent. Prefabricating the preliminary work at the shop prior to assembly at the job site saved more expense and permitted the sheet metal contractor to do all the shop work ahead of time and schedule erection work the day school was dismissed.

Each panel consists of a galvanized

backup sheet, 1½ in. of non-combustible insulation and an outside sheet formed into two curved indentations alternating with two rectangular protrusions, both running vertically. Panels were trimmed to various lengths: some 18½ ft long which extend from grade level to roof, others made shorter to fill in between window levels, above windows and doors, etc. Exterior panels of 18 ga satin finish galvanized sheet combine beauty and durability in the annex.

Panels Welded to Frame

Backup panels were clipped to the lightweight frame, then welded. The 1½ in. insulation pad was fastened in place by a 1 in. wide galvanized iron strap welded to the seam of the backup sheet. Then the front panels were positioned and button punched to hold overlapping seams in place. The outside panels were welded in

position at the bottom and top and flashing strips were installed.

Workmanship Shows up

The 2 ft roof overhang is trimmed with satin finish galvanized fascia. The absence of "waves" which appear in hastily and inadequately fastened metal trim testifies to the quality of workmanship employed on the job.

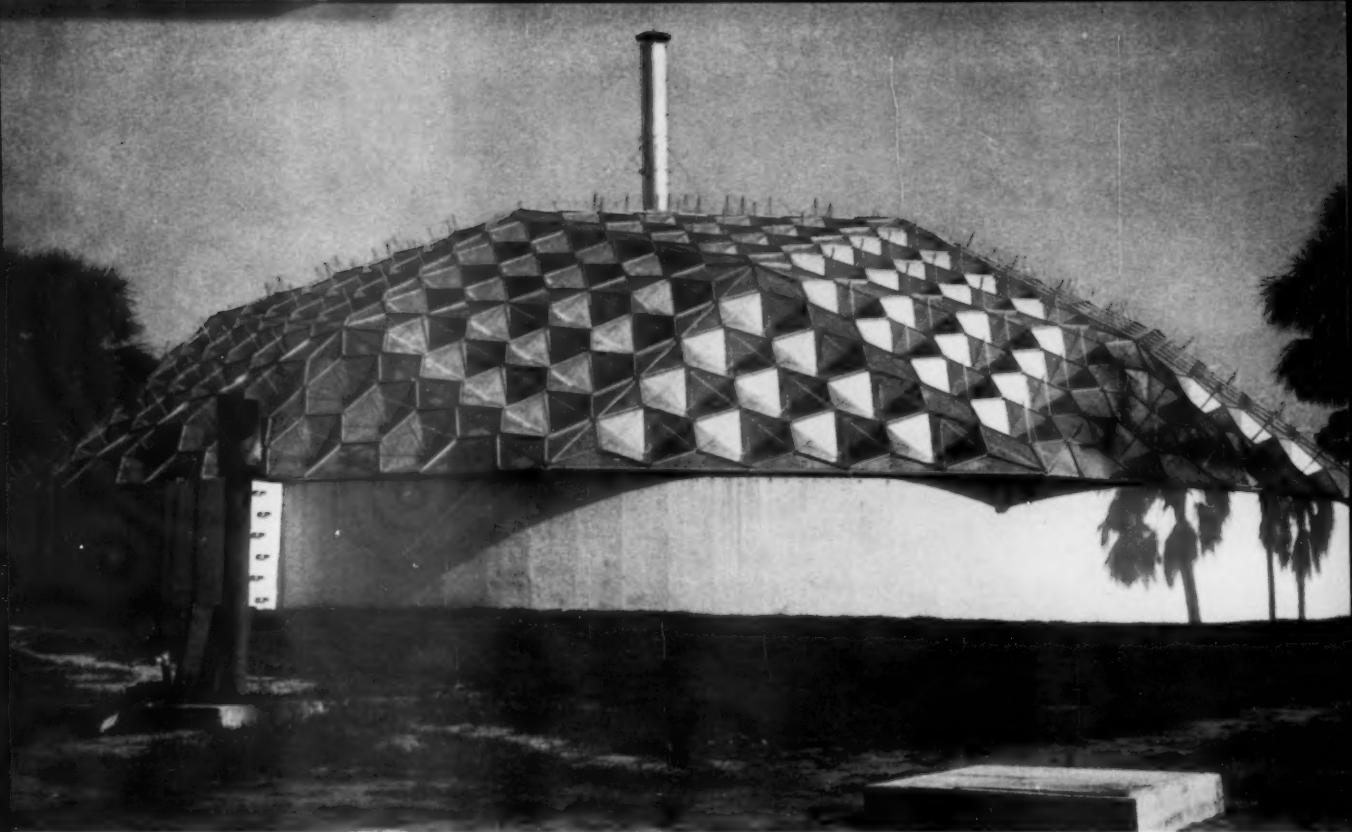
Interior walls are gypsum lath and plaster, fastened to the inner side of the lightweight frame, leaving approximately 4 in. air space between interior and exterior walls.

To harmonize with the annex, the ceilings in the old building were lowered and the windows were reduced to half their original height. The old window frames were completely removed and a lightweight frame of metal studs was installed in the top part of the opening above the new windows. Over each of these frames were placed a backup sheet, 1½ in. of blanket insulation and an exterior metal curtain wall panel which matches the sheathing on the new building.

Dropped Ceilings Hide Ducts

On each floor of the new two story addition are four 32 × 23 ft classrooms, a boys' and a girls' rest room and a storage room. Each classroom has its own wardrobe room. Ventilation and heating are provided by a forced warm air heating system. Ducts are located in the spaces above the dropped ceilings in the corridors.

The sheet metal contractors who engineered and erected the installation are Robert and Arnold Holming, the Holming Co., Milwaukee. The architect is Walter M. Trapp, also of Milwaukee.



Honeycomb Dome Answers Peculiar Roofing Demands

. . . of a sewage treatment plant which requires rigid cover, provision for fume release and support from above rather than below. Concave metal cells comprising a dome roof met the unusual need nicely

AN UNUSUAL DESIGN was developed for a metal roof to cover a circular sewage treatment plant 140 ft in diameter at Sarasota, Fla. Specifications for the roof required that the aluminum panels be supported from above rather than below. This supporting frame consists of 3 in. aluminum tubing shaped into six-sided pyramids. The base of each pyramid is joined to its adjacent pyramid bases for mutual support.

Six metal panels form a concave cell, the center of which is bent inward. Joining each of these six-sided cells with similar cells results in a honeycomb effect for the entire dome. Support comes from joining the triangle bases of each panel in the cells so that no two bias or

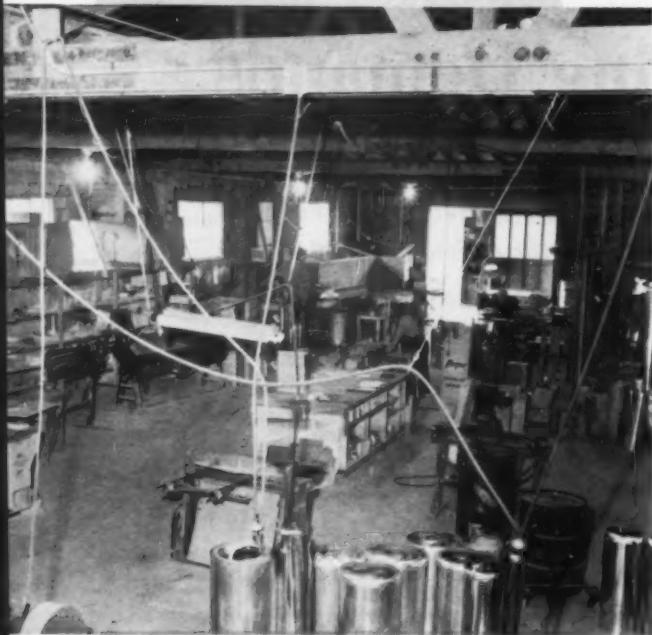
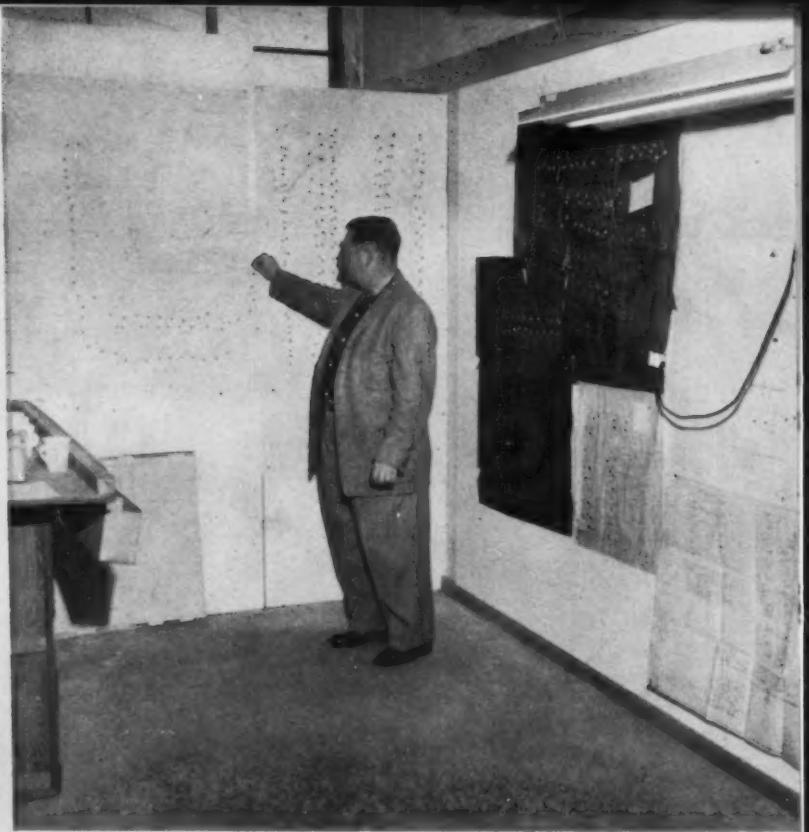
selvaged edges come together. This method of forming the joint produces stability since each panel is riveted and bolted to its adjacent member.

Cells were designed to a tolerance of 0.005 in. to prevent distortion of the roof pattern. However, the roof was designed to permit a minute quantity of gas seepage between cells. This is one of the principles involved where lightweight roofs are used in areas where hurricanes, with their accompanying low barometric pressures, are an annual phenomenon.

The roof was designed and fabricated by Jeffery Lindsay, Beverly Hills, Calif., and installed by Superior Metal Products Co., Sarasota, Fla. Cost was \$35,000.

Close Control Streamlines Big Volume Operation

WORK IN PROGRESS record is maintained on large tract maps to keep Earl Darrow posted on work accomplished and what remains to be done



SPACIOUS SHOP with full array of modern sheet metal equipment keeps production at top efficiency, makes firm self-sufficient. Network of electrical cables supplied power before building was completed

Large heating-air conditioning business is built on solid foundation of sound management policies, self-sufficient shop and close cooperation between fabricating and installing teams to eliminate waste in motion and materials

INSTALLING MORE THAN 1500 warm air heating systems a year has become routine for Darrow Heating Corp., North Hollywood, Calif. Nobody gets flustered, emergencies are rare, and builders have learned that they can depend upon Darrow no matter how tight schedules may get.

The secret is in good management, an efficient shop, and a carefully planned materials handling procedure.

All fittings, plenums and ducts are prefabricated in the shop. Furnaces, air conditioning units and other equipment are received at the headquarters warehouse rather than delivered to the job site. Each crew of installers works from a blue print prepared in the office. There is a written record of all steps from layout to completion.

President Earl Darrow, who launched his business 10 years ago, acknowledges that he does have a smooth run-



SPACIOUS DOCK (top) is at proper height for easy loading of vehicles with materials needed for each job. Cartons of fittings standing on dock are assembled in the warehouse (right) for each house and are waiting for installers every morning



ning organization but passes the credit on to key personnel among his 32 employees. One son, Glenn, is superintendent in charge of shop and field operations. Another son, Don, handles outside sales, assists in engineering, and helps with supervision. The office "girl Friday," Mrs. Ruth McDermott, turns out a mountain of paper work on schedule. Before Henry Barron was hired to handle engineering, she did most of that work and still pinch-hits when she's needed.

Stock control is maintained by the shop fabrication technique. Everything the installers need at the job site is ready to go when they report for work. And because the firm fabricates all its own parts the proper inventory level can be maintained on all items.

Firm Is Self-Sufficient

This practice would hardly be justified were it not for the large volume of work handled, Mr. Darrow points out. He can do it economically, however, when he is completing up to 150 installations a month. Occasionally it becomes necessary to buy pipe and fittings from outside sources, but as a general rule the company is entirely self-sufficient.

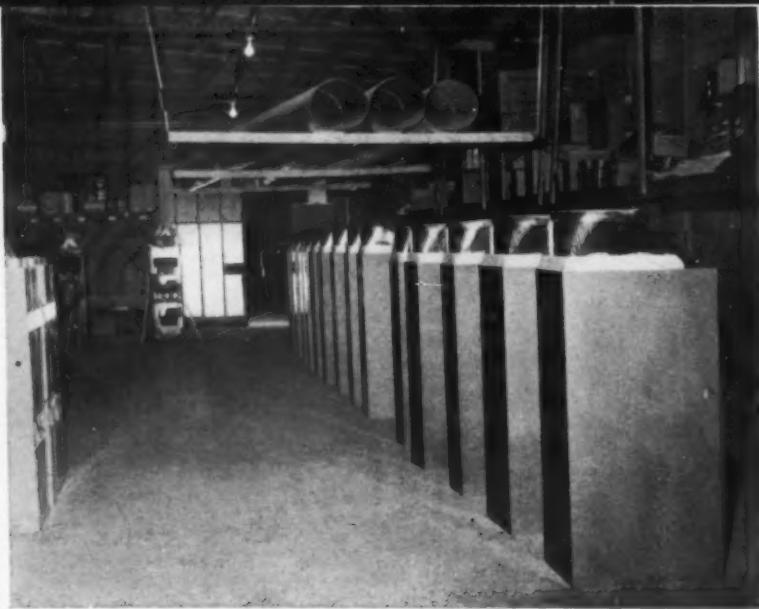
Although it's the residential project work which makes

it possible to maintain an elaborate shop, the same efficiency extends into other types of heating and air conditioning work. For example, when a contract is obtained for a custom-built residence, special fittings can be fabricated immediately. Of course, this same fact speeds up Mr. Darrow's service and thereby gives him another sales point. As a rule he has orders for installations in about 100 custom-built houses on hand at all times. Falling into the same category are small groups of four or five houses in the \$50,000 and up bracket. This type of residential contract work serves as an equalizer to project operations, in which violent fluctuations can occur when builders encounter land, financing and sales problems.

Efficiency Is Evident

The spacious shop is in a 10,000 sq ft building which also houses offices and storage bins for fittings. Everything has its place in the shop. Confusion is non-existent and the floor is clear of debris. The atmosphere is quiet and an observer gets the impression that employees enjoy working at top efficiency.

Machinery is kept in perfect working order. Most of the equipment is standard in sheet metal shops; however, several machines have been specially made for the



TRANSITIONS ARE INSTALLED and operational tests performed on each furnace delivered to the shop before it is released to be sent to the job site

firm. An example is a large duct beading machine, built to Mr. Darrow's specifications, which crimps and beads sections of round duct in one operation, eliminating need for spot welding or soldering.

Various size dies are available for the collar stamping machines, making it possible to manufacture fittings of different radii by changing the die. One 42 in. slitter used on raw stock has a bank of cutting wheels which make 5 cuts in one operation. The shop also has a narrower slitting machine, a metal cutting band saw, spot welders, seamer, and other equipment.

Directly behind the shop is a 10,000 sq ft warehouse. The contour of the gently-sloping terrain provides an ideally situated loading dock extending around two sides

of the structure. The loading dock varies in height from 30 to 42 in. Big semi-trailer trucks back up on the high south side to unload furnaces directly onto hand trucks.

Larger equipment, such as heavy air conditioning units, is unloaded by the company's 2 ton fork lift truck. The fork lift is in constant use and cuts down tremendously on the man-hours for manual handling. Earl Darrow buys all materials f.o.b. his plant so his men can work where they can achieve top efficiency under close control which would be difficult if orders were picked up from various suppliers. All incoming metal shipments, and even hard asbestos duct are handled by the fork truck.

Every night company trucks manned by installation



SPECIAL LOCK FORMER cuts time in forming round duct edges



SLITTER WITH FIVE CUTTING WHEELS speeds up sheet metal parts production

crews are backed up to the dock on the west side of the building. A wide overhang provides ample weather protection. Nearby is a gas pump which was installed to cut down on time wasted in service stations and adjacent coffee shops.

A special packaging system increases the efficiency of installation mechanics. All the fittings, plenums, hangers and other components necessary for each house are packed in a large cardboard carton. Larger homes may require two cartons.

Instead of reporting to the site, mechanics come to the warehouse every morning. The cartons are already assembled for them and marked according to project and house number. The journeyman moves his cartons from dock to truck bed, obtains the duct lengths needed from a supply located just inside the warehouse door and is on his way. The cartons of fittings include some "overage" to eliminate time-consuming returns to the shop to pick up parts which were overlooked.

Having materials shipped directly to the job and stored in nearby warehouses or garages has never worked satisfactorily, according to Mr. Darrow. Workmen spend time assembling the materials they need, which could much better be spent in actual installation. He believes it's more efficient to have warehouse employees handle the job, just as it's more desirable to have all fabricating work done under shop conditions rather than in the field.

Furnaces Delivered to Shop

While most southern California dealer-contractors have suppliers ship furnaces directly to the job site, the Darrow firm insists that they be first checked out at the shop. They make sure electrical transformers and blowers are in good running order. Thermostat cards and plenum transition fittings are installed on the furnaces in the warehouse rather than at the job site, because Mr. Darrow has found that such work can be much more quickly and easily accomplished under shop conditions. This policy also eliminates the problem of disposing of furnace and parts cartons at the job. (Smog regulations forbid burning them in the open.)

Written records of each job give management full information for control and billing. Blue prints and other records on individual houses are placed in a manilla envelope on which is printed a step-by-step record of installation progress and billing procedures to show the current status of the job at a glance. Project work is handled as a unit with progress reports posted on a control record in the office. A rough layout sheet with squares for each room of a house is used for sketching duct plans. File cards record the separate operations as they are performed. Individual cards are used for roughing-in the duct system, setting the furnace and installing registers.

Formerly, installation mechanics noted work progress on their time cards. This system was discarded in favor of individual progress sheets on which they indicate with check marks the steps completed on each job.



BLUE PRINT MACHINE turns out any number of high-quality duplicates quickly

A check of these cards in the office quickly shows Mr. Darrow and his supervisors which phase of work needs attention. This card check is also used for billing, which is done at three stages: after rough-in inspection, when the furnace is set and on completion. A system of colored tacks denoting work accomplished on large tract maps gives a graphic visual presentation of the work that has been completed and the locations of houses in which work is to be scheduled.

Work Orders Duplicated

Daily work orders are written at a desk in which every journeyman has both a clip board and a shallow box holding papers assigned to him. The orders are entered in a notebook, with a carbon under each, so a copy remains at the desk if it becomes necessary to check back on job assignments.

All crews work from blue prints, whether they are engaged in an elaborate custom installation or a routine project house job. There is no waiting for these prints — a large machine in the office duplicates them on the spot. Speed is especially important when a builder wants prints quickly for use in obtaining VA and FHA approvals.

Earl Darrow believes that within the next five years year 'round air conditioning will become as standard in home construction as forced warm air heating is today. Many builders who do not now offer summer air conditioning in their houses do, at Mr. Darrow's suggestion, size heating ducts to handle the increased air volume should cooling be added later. This foresight by the company's officers has been responsible for sales of many add-on summer air conditioning systems.

Before it's too late

Review Your Products Liability Coverage



IMPROPER FLUE VENTING WAS LISTED as a possible source of this fire, which could have been costly to the dealer-contractor if he hadn't been covered by products liability insurance

A special study report by SMACNA reveals that a scrutiny of your operational breakdown might result in substantial savings in premiums or increased protection from this vital insurance

WITH THE CONSTANT tightening of competition, sheet metal contractors and dealer-contractors must constantly reassess their expenditures. Insurance cost, for one, is often reviewed when economy drives are launched. At the same time, contractors and dealer-

contractors are periodically reminded, usually by the sad experience of a fellow contractor, that certain forms of insurance, though relatively costly, are musts, particularly to the sole proprietor or partnership type of business.

By far the most perplexing insurance coverage problem of sheet metal, heating and air conditioning dealer-contractors is the much discussed products liability and completed operations insurance, or "products liability" as it is more informally known.

According to a recently published special study report by the Sheet Metal and Air Conditioning Contractors' National Association, despite repeated reports of losses by dealer-contractors, "to carry or not to carry" is still a prevalent question. Furthermore, some dealer-contractors do not realize they are carrying only "limited" products liability and completed operations insurance.

Classify Risk Properly

One of the reasons some sheet metal contractors do not carry products liability insurance is its cost. High cost and excessive premiums for products liability insurance generally can be traced to misclassification of risk.

Previous special study reports by SMACNA on insurance have emphasized the necessity of a thorough breakdown of operations in order to determine premium costs. Work should be segregated so premium charges can be based on the volume of work to which each different premium rate applies. This segregation need not be done in a contract, but should be done in the company's bookkeeping system.

Classify All Operations

New sales should be segregated from all other work. Service work should also be segregated. Service work under warranty should not be

included in service sales, even if it's charged to a reserve set up in the original job, since the warranty period is covered by the new installation premium. Straight air conditioning work should be separated from heating work. The insurance agent can help compute the premium rates based on this segregation if he is familiar with contracting. In any event, make sure work is segregated into various classes in order to avoid paying a higher rate than that which applies to the various operations classification.

The SMACNA report cites certain examples, and in so doing refers to limits of liability, such as 100/300 bodily injury and \$50,000 property damage. This does not mean that SMACNA is making any recommendations as to the amount of coverage any sheet metal contractor should have.

Premiums for Service Are High

One example in the report describes fully the difference between the sale, installation and service under warranty of new equipment, and the servicing and repair of equipment. Premiums for the latter category, whether it applies to furnaces, air conditioners or refrigeration equipment, are generally the most expensive.

To illustrate: take a hypothetical sheet metal contractor and breakdown his operations (see example) for purposes of illustration only, and not for purposes of recommendation. As stated before, SMACNA does not recommend any "amount" of coverage, although experience shows that it is wise to recommend "being covered."

Reassess Your Coverage

SMACNA suggests that all contractors reassess their insurance coverage, with the view of clarifying their situations in connection with products liability insurance.

This information was summarized from the SMACNA special study report by permission of Executive Secretary Joseph D. Wilder.

EXAMPLE OF OPERATIONAL BREAKDOWN:

A HYPOTHETICAL sheet metal contractor is engaged in warm air heating, air conditioning and general sheet metal work, and he installs combination heating and air conditioning units. His operations, broken down, are as follows:

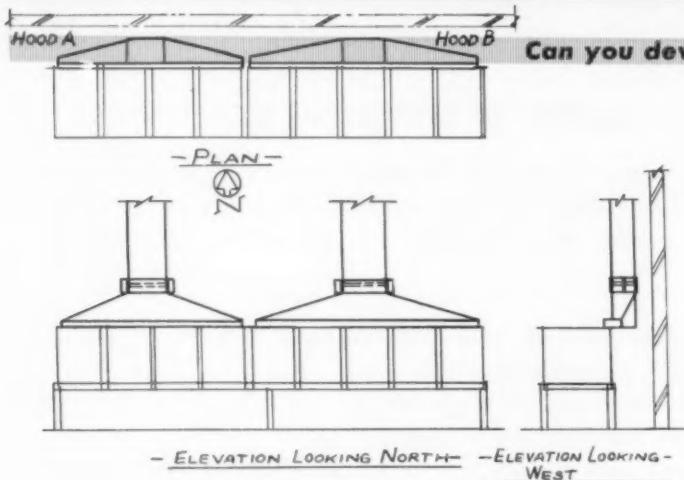
Warm air heating and combination heating and air conditioning sales — including service under warranty (gas or oil)	\$225,000
Air conditioning units — including service under warranty	100,000
General sheet metal work — gutters, flashings, etc., N.O.C. (not otherwise classified)	100,000
Heating and combination heating and air conditioning service	15,000
Air conditioning service	10,000
Gross volume	\$450,000

All our hypothetical contractor's installations carry a one-year warranty, including free service during the warranty period. The service figures relate only to service of equipment out of warranty or service on equipment installed by others. For coverage of \$100/\$300,000 for bodily injury and \$50,000 for property damage, his total premium breakdown, using average premium charges, would be as follows:

Heating and combination heating and air conditioning sales	Bodily Injury	Property Damage
\$225,000.....	\$317.25.....	\$256.50
Air conditioning sales	15.40.....	22.80
General sheet metal 100,000.....	15.40.....	45.60
Heating and combination heating and air conditioning service	86.01	106.00
Air conditioning service	15.00 (min.)	10.00 (min.)
Total	\$449.06.....	\$440.90

The total premium charges paid for products liability and completed operations insurance coverage by our hypothetical contractor are \$889.96 — approximately 1/5 of 1 percent of his gross sales. His premium would be reduced if, over a period of time, he shows a good experience rating as far as claims are concerned — which can frequently be accomplished by observing a few precautions, particularly in connection with service work.

HUGH REID'S SHEET METAL PATTERN



Can you develop this pattern in two hours?

Here's a new and accurate approach to the development of sheet metal patterns that will cut costly layout time. The method applied to this month's fitting can be used as a guide to develop related patterns and solve other problems encountered at the layout bench.

1 PATTERN PROBLEM is applied in exhaust system for experimental hand plating operation

Here's Simplified Layout for a Double Tapered, Slotted Exhaust Hood

. . . which can be applied to any hood of its type, regardless of size or job to be done

THE DOUBLE tapered slotted exhaust hood illustrated in Fig. 1 is the pattern problem for this month.

In calculating the hood slot opening we need to know the type of solution in each tank, the surface area of the liquid in the tank in sq ft and the recommended cfm of air per sq ft of surface area to be exhausted by the fume removal system. Assume hood A is covering four separate acid dip tanks, each 2×2 ft. The liquid area of each tank is 4 sq ft. The recommended exhaust per sq ft of surface area for acid dipping is 250 cfm; thus, $250 \text{ cfm} \times 4 \text{ sq ft} = 1000 \text{ cfm}$. One thousand cfm $\times 4$ tanks = 4000 cfm to be handled by hood A. The recommended velocity for acid fumes is 2000 cfm. The open exhaust area of hood A in sq ft will be 4000 cfm/2000 fpm = 2.0 sq ft or 288 sq in.

The length of hood A is 4×24 in. = 96 in.; and $288/96 = 3$ in. Thus, there will be four hood slots, each 24 in. long and 3 in. high. The cubic area within hood A should be in-

creased to permit a velocity drop which will let heavier water particles to fall out of the air stream and back into the tank.

In designing hoods for this type of system, try to locate the seam at the top to avoid leakage which is costly when seams must be repaired.

Following is the step-by-step solution to the pattern problem. The patterns can be developed directly from the dimensions on a blue print, but it is recommended that the end view (Fig. 3) be constructed and the true length lines be transferred from Fig. 3 to the developed patterns.

End View Drawing, Fig. 3—

a) Draw a horizontal line and establish the point A at its left end. From point A, measure $1\frac{1}{2}$ in. and $\frac{3}{8}$ in. to the right and locate points B and C. From points A, B and C draw vertical lines perpendicular to line AC. Measure up $\frac{1}{4}$ in. from points A and B and locate points D and F.

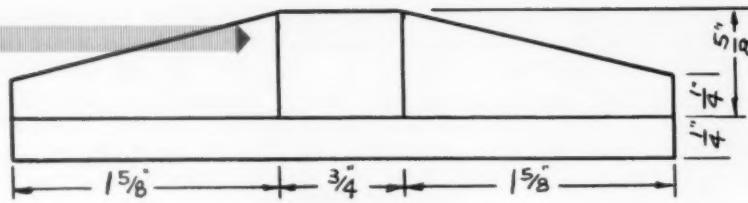
Draw a line to connect points D and F.

b) From point D, measure $\frac{1}{4}$ in. to the right and locate point E. From this point draw a line perpendicular to line DF. Measure $\frac{1}{2}$ in. above point E on the perpendicular line and establish the point G. Measure $\frac{3}{4}$ in. up from point C and locate point H. Draw lines GH and FH. Measure $\frac{1}{8}$ in. above line GH and draw the parallel line JK.

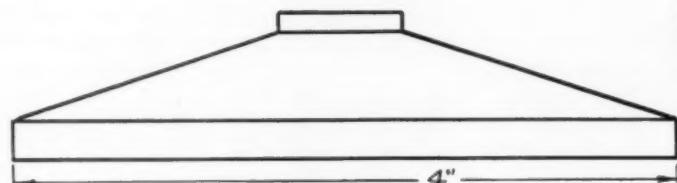
Front and Top Pattern, Fig. 4—

a) Draw a horizontal line and establish the point L at the left end. Working from Fig. 2A, transfer lengths $1\frac{5}{8}$ in., $\frac{3}{4}$ in. and $1\frac{5}{8}$ in. to the right of point L and mark the points R, S and M. Through points L, R, S and M draw lines perpendicular to and above line LM. From points L and M measure up $\frac{1}{4}$ in. and locate points N and O. Draw line NO. Mark the intersection points of the perpendicular lines drawn from points R and S with line NO as points T and U. From T and U measure up $\frac{1}{2}$ in. to establish points V and W. Draw lines NV, VW, and WO.

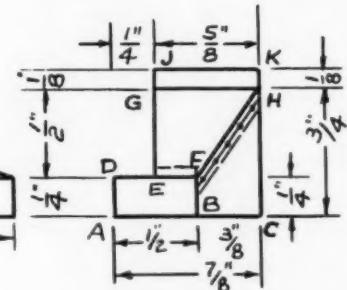
b) From points O and W draw



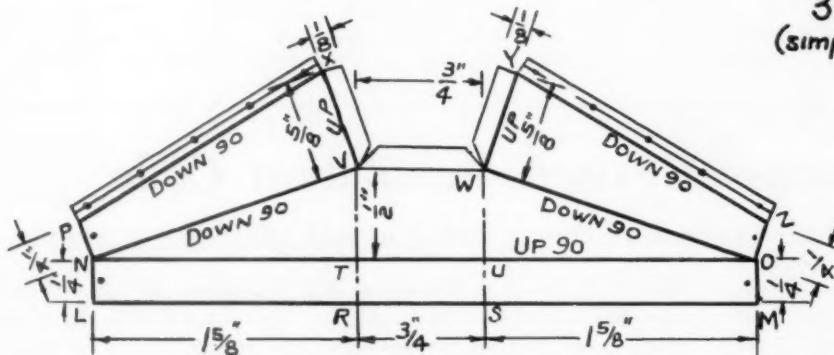
2A Plan view



2B Front view



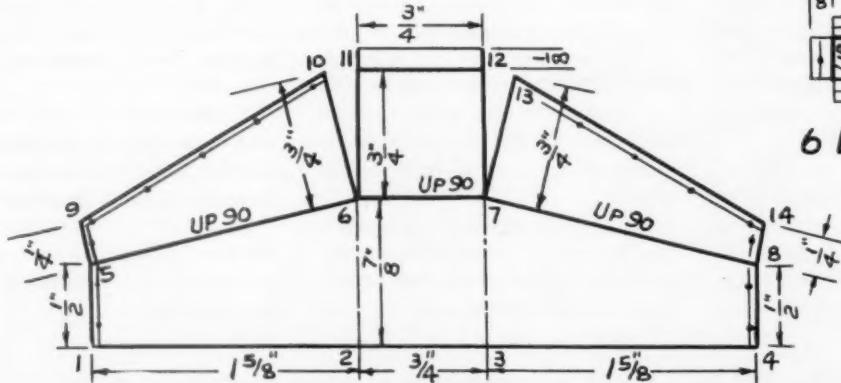
3 End view
(simplified method)



4 Front and top pattern



6 End pattern



5 Back and bottom pattern

NOTE: THESE PATTERN DIMENSIONS should be multiplied by the pre-determined ratio figure to produce the actual size of the fitting needed

TEAR OUT THESE PAGES AND FILE THEM FOR FUTURE REFERENCE

lines perpendicular to and above line OW. Measure the given $\frac{1}{4}$ in. length on the line drawn from point O and mark the point Z. Measure $\frac{5}{8}$ in. on the line drawn from point W and mark the point Y. Draw line YZ.

c) From points N and V draw lines perpendicular to and above line NV. Measure up the given $\frac{1}{4}$ in. length on the line drawn from point N and mark the point P. From point V, measure up the given $\frac{5}{8}$ in. length and mark the point X. Draw the line PX.

Back, Bottom Pattern, Fig. 5—

a) Draw a horizontal line and establish point 1 at the left. Transfer the given $1\frac{5}{8}$, $\frac{3}{4}$, and $1\frac{5}{8}$ in. dimensions, as shown on Fig. 2A, to the right of point 1 (Fig. 5). Identify

the points as 2, 3 and 4. From points 1, 2, 3 and 4 draw lines perpendicular to line 1-4.

b) From Fig. 3, transfer length $\frac{1}{2}$ in. (AB) to the perpendicular lines drawn from points 1 and 4 (Fig. 5). Mark the points 5 and 8. Transfer total length $\frac{7}{8}$ in. (CK) from Fig. 3 to the lines drawn from points 2 and 3 and mark the points 6 and 7. Draw lines 5-6, 6-7 and 7-8.

c) Draw lines from points 5 and 6 perpendicular to and above line 5-6. From Fig. 3, transfer the $\frac{1}{4}$ in. length (BF) to the line drawn from point 5 (Fig. 5) and label the point 9. Transfer the $\frac{3}{4}$ in. length (CH) from Fig. 3 to the line drawn from point 6 (Fig. 5). Identify the point as 10. Draw line 9-10.

d) From points 7 and 8 draw lines perpendicular to and above line 7-8.

Transfer the $\frac{1}{4}$ in. length (BF) from Fig. 3 to the line drawn from point 8 (Fig. 5) and label the point 14. Transfer the given $\frac{3}{4}$ in. length (CH) from Fig. 3 to the line drawn from point 7 (Fig. 5) and establish the point 13. Draw line 13-14.

e) Draw lines from points 6 and 7 perpendicular to line 6-7. From Fig. 3 transfer the given $\frac{3}{4}$ in. length (CH) to the lines drawn from points 6 and 7 and mark the points 11 and 12. Draw line 11-12.

End Pattern, Fig. 6—

Draw a rectangle equal to the given $\frac{1}{4}$ in. width (AD) and $\frac{1}{2}$ in. length (AB) as shown on Fig. 3. Add allowances for seams and joints, lay out the rivet holes and mark the patterns for fabrication.

Discuss Revised Ventilation Code

"Fathers" of altered code urge close scrutiny of and adherence to provisions

THE VENTILATING & Air Conditioning Contractors' Association of Chicago was host to the Chicago Association of Consulting Engineers at a recent meeting in Chicago's Bismarck Hotel. Speakers John J. Aeberly and Frank Ford, both of the Chicago Bureau of Heating, Ventilation and Industrial Sanitation, discussed the problems developing from the revision of the municipal ventilation code last year. Attendance totaled 116.

W. A. Kuechenberg, president of the ventilating and air conditioning group, expressed the appreciation of his association to John Dolio, E. P. Heckel Sr., William Goodman, Charles Kuglin, Silas Cartland, R. J.

Houkal Jr. and S. I. Rottmayer, all of whom represented the consulting engineers on the Code Revision Committee. He pointed out that these men, together with L. L. Narowetz and P. R. West of the ventilating and air conditioning association, worked for more than two years on the revision of the ventilation code. Mr. Kuechenberg pointed out that this is only one example of the many activities undertaken in the interest of the industry by members of both associations.

Mr. Aeberly discussed administrative aspects of the ventilation code. He explained that ventilation is only a part of the building code, and thus

paragraphs and chapters of the code pertaining to other phases of building sometimes prevail in certain situations. This is a point that is often overlooked by engineers as well as contractors, he said.

Mr. Ford presented a series of 10 slides, nine of which demonstrated specific changes introduced into the code when it was revised. The tenth slide illustrated a new ventilation data chart which is recommended for all plans submitted for approval (see facsimile of chart headings below).

Many controversial points were explained and clarified in a question-and-answer period following the formal presentation.

NEW VENTILATION DATA CHART is recommended for all plans to be submitted for approval

Index or room no.	Room purpose	Floor area, sq ft	Ventilation Data						Remarks	
			Ordinance requirements			Plan requirements				
			Natural light & ventilation	Mechanical ventilation	Relief opening	Natural light & ventilation	Mechanical ventilation	Relief opening		
Sq ft glass area	Sq ft vent area	Cfm air supply	Cfm air exhaust	Sq ft duct area	Sq ft grille area	Sq ft vent area	Cfm air supply	Cfm air exhaust	Sq ft duct area	Sq ft grille area

PRACTICAL APPLICATIONS for engineering, installing and servicing residential cooling systems



Design Add-On Air Conditioning

To Fit in . . .

By S. W. Reid
Air Conditioning Engineer
Gilbert Associates, Inc.

...with the existing heating system. Whether the same ducts are used for heating and cooling, or the two systems are completely independent, the end result must be complete comfort the year around

SURVEYS BY American Artisan and others show that the number of central residential air conditioning installations is about equally divided between new and existing houses. This comparison indicates not only that the demand is growing among owners of older homes but also that such installations are becoming more

practical and profitable for dealer-contractors.

We can presume that most houses in this country which are occupied the year around have some kind of heating system. The types of systems vary widely, just as do the cooling systems designed to combine with them for year 'round comfort.

Among the most commonly encountered heating systems are:

- 1) Forced warm air
- 2) Gravity warm air
- 3) Floor or wall furnaces
- 4) Hot water or electric radiant heat in floor or ceiling
- 5) Hot water or steam heated radiators or convectors.

TABLE 1 — CAREFUL SELECTION and design of summer air conditioning system to fit in with existing heating system helps assure maximum possible year 'round comfort. Checks indicate cooling arrangements suitable for combination with each type of existing heating system commonly used

TYPE OF HEATING SYSTEM	TYPE OF AIR CONDITIONING SYSTEM					
	Self-contained unit for cooling only	Cooling coil in duct, remote condensing unit	Year 'round unit for heating and cooling	Fan-coil unit with remote condensing unit	Fan-coil unit with remote chiller and boiler	In-the-wall self-contained unit with hot water coil
1 Forced warm air	✓	✓				
2 Gravity warm air	✓		✓			
3 Floor or wall furnace	✓			✓		
4 Hot water or electric radiant heat	✓			✓		
5 Hot water or steam radiators					✓	✓

Let's consider in general what type of cooling system is best combined with each of these basic heating arrangements.

Forced Air System Ready Made

The most favorable arrangement for installation of central summer air conditioning is the existence of a modern, well-designed forced warm air heating system (No. 1, Table 1). Duct sizes throughout the system must be checked against the requirements for cooled air. Inadequacies are compensated by additional branches and trunks which are run back to the unit to avoid overloading or unbalancing the existing trunk ducts.

The converted forced air system must be checked for protection from moist warm air and vapor-proof insulation must be applied wherever

possible to ducts which run outside the conditioned space.

Assure Proper Distribution

The dealer-contractor must also study the supply registers for proper distribution, particularly those located low on inside partitions. These registers should, if possible, be adjustable so warm air can be forced forward in the winter and cool air can be directed upward in the summer. The natural buoyancy of warm air delivered horizontally at low velocities makes it rise and mix with room air before it flows into the occupied zone. Cool air, on the other hand, will not rise and would travel across the floor and create a draft if directed horizontally.

Cooling may be added to a forced warm air system through a number of equipment arrangements. If space

is available, a self-contained unit can be located close to the heating unit in either a series or a parallel relationship. If space is limited, a direct expansion cooling coil can be installed in the main supply duct, either at the furnace outlet or in a vertical or horizontal duct. The condensing unit can be placed at any convenient spot, indoors or outdoors. The former is preferred if the unit has a water-cooled condenser.

Check Blower, Motor Ratings

One of the decisions that must be made in connection with installing a cooling coil in a warm air system is whether or not the furnace blower and motor are adequate. There is no rule-of-thumb for making this decision. There are, however, some facts that can be studied in this connection. For instance, we know furnaces

are usually designed for about 9 cfm per 1000 Btu input. The latter value generally is stamped on the furnace data plate.

Another guide to the amount of air a blower can handle is its size. The following wheel diameters are usually required for forward curved centrifugal fans:

Cooling capacity	Cfm	Diam. of fan		
		Single width	Double width	Probable fan hp
2 tons	800	12 in.	9 in.	1/6
3 tons	1200	15 in.	10 in.	1/3
5 tons	2000	18 in.	12 in.	1/2

Use Gravity System Ducts?

Older two story homes heated by gravity warm air systems (No. 2, Table 1) present interesting problems for the air conditioning dealer-contractor. He must decide how to use existing air ducts and outlets best to produce both heating and cooling. To save expense, the ultimate system may incorporate certain compromises with preferred methods of air distribution. It is sometimes difficult to know how much of a departure from recommended practice can be made.

Gravity warm air systems usually introduce air into the first floor through supply outlets at the inside partitions. Return grilles are in the floors near the outside walls. On the second floor, the supply outlets are usually in the inside partitions just above the baseboard. These outlets are usually so large that air leaves the register at an angle of about 30 deg from vertical. Stacks will generally be the largest ($3\frac{1}{4} \times 14$ in.) that can be fitted between the studs. Air from the second floor usually returns to a central grille at the bottom of the stairway.

Reverse Air Flow

Since all gravity systems are not the same, there can be no universal procedure for adding cooling. However, with the typical arrangement described above, a good practice is to reverse the flow of air on the first floor, using the former outside wall returns as supply locations and the former inside wall supply outlets as

What Is 'Air Conditioning'?

True air conditioning provides comfort in all seasons of the year, according to the American Society of Heating and Air-Conditioning Engineers. The ASHAE defines air conditioning as follows:

"Air conditioning is the process of treating air so as to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space."

returns. Each opening would, of course, be fitted with the proper type and size register or grille. Introducing the supply air at the outside walls improves the heating system by blanketing the cold walls with warm air, minimizing the natural downward flow of cold air from these comparatively cool surfaces.

The air flow pattern on the second floor can be revised the same way, providing the old system has individual return grilles and ducts as we assumed for the first floor. Satisfactory year 'round air conditioning can be achieved, however, by using existing supply outlets on inside walls for cooling as well as heating. The air flowing upward through the open-faced gravity registers will mix rapidly enough with room air.

Suggest Replacement Job

In considering summer air conditioning, the home owner may be receptive to suggestions for replacing his old gravity furnace with a complete year 'round system incorporating all the equipment needed for heating, cooling and circulating air. These units are also available with air cooled condensing units for remote installation.

If the existing gravity furnace is in good condition, it may be more

economical to convert it to forced air circulation by adding a self-contained air conditioner or a fan section and cooling coil with a remote condensing unit.

Avoid Condensation

When a gravity system is converted to a year 'round service, special attention must be given to the structure around supply stacks and stackheads. Stud spaces which contain ducts carrying cool air must be sealed completely from the attic or other parts of the house which are exposed to outside air. Otherwise, moisture brought into these spaces with the outside air will condense on the ducts and eventually damage the walls. Also, considerable cooling capacity will be lost through these exposed stacks. Insulation with a vapor-resistant jacket should be applied to all existing and new duct sections that are accessible.

Separate AC System Required

Single story residences which are heated by wall or floor furnaces (No. 3, Table 1) require independent cooling systems. No one arrangement will suit all buildings. The choice will probably involve consideration of an attic, a crawl space, a basement, a utility room or a furred down closet as locations for a fan-coil or self-contained unit.

If the air conditioning unit is located in the attic, the supply air system would likely consist of duct work in the attic feeding ceiling or high side wall outlets. Air probably would be returned through a central return grille in the hall ceiling.

Central Return Is Adequate

If the cooling unit were in a crawl space or basement, a radial perimeter or extended plenum supply system with outlets in the floor near outside walls would probably be designed. A central return usually is adequate, depending of course, on the length and layout of the house.

If a fan-coil unit is installed in the top of a closet, the duct system could

be furred down in the hallway with high wall supply air outlets. Return air would move out through open doors to the hall, then back to the coil through a central return grille.

A remote condensing unit normally would be used with a crawl space or closet-located fan-coil unit. The attic, basement or utility room might lend themselves to self-contained equipment.

Radiant Heat Leaves Choice

A radiant floor or ceiling heating system (No. 4, Table 1) with hot water or electric coils imposes no particular restriction on the type of cooling system that can be used except that the installation must not interfere with the heating coils.

When radiant floor heat is encountered in single story ranch type homes with slab floors, the air conditioning equipment and duct work usually can be located in the attic. Where this is not practical, it may be possible to locate a fan-coil unit in the top of a large closet or storage room. An extended plenum duct system from the unit might be furred down in the hallway so it can feed high wall supply air outlets in the partitions. Air would return via the corridor to a central grille which opens to the cooling unit. The condensing unit could be located in the utility room or outside.

Install Heating-Cooling Coils

The hot water radiator system (No. 5, Table 1) lends itself to several add-on air conditioning arrangements. The radiators might be replaced by in-the-wall, air cooled package air conditioners with built-in hot water convective coils. Sizable holes must be cut in outside walls to receive the cabinets and to provide access to outside air for condensing. Special wiring to each unit may be required. Original hot water piping would be connected to the new coils.

Radiators might be replaced by fan-coil units designed for both heating and cooling. When this type unit is used, a central water chilling package is added in parallel with the boil-

THIS SPECIAL SERIES

. . . on subjects of interest to residential air conditioning dealer-contractors is based on the author's wide experience and on constant analysis of the field by American Artisan's editors.

IT ALL BEGAN

. . . with a complete rundown on fundamentals in 20 articles beginning in August, 1952 American Artisan, describing basic operations of air conditioning equipment.

SPECIFIC PROBLEMS

. . . treated in the next phase of the series covered maintenance, service, installation and management.

NOW, PRACTICAL APPLICATIONS

. . . to solve common problems which have been experienced by the author and by dealer-contractors are covered in the current selection of case histories, procedure outlines and specific examples.

er so either hot water or cold water may be supplied to the room fan-coil unit. Existing piping may be reused if it is a two-pipe system. (A single pipe loop system with special flow fittings should, if practical, be replaced by a new two-pipe system.)

Same Applies To Steam System

A steam radiator system (No. 5, Table 1) may be converted to year-round duty by employing the same two types of summer air conditioning equipment suggested for hot water. With an in-the-wall package air conditioning unit, a built-in steam convective coil could be used. In the case of the fan-coil unit, it would be necessary either to operate the boiler to supply hot water instead of steam or to put in a steam-to-hot-water heat exchanger to obtain water for the unit coils since they could not be used alternately for steam in the winter and water in the summer.

Weigh Indirect Effects

A number of more or less indirect factors are related to any air conditioning study made for an existing house no matter what kind of heating system it has or what type of cooling equipment is considered.

One such factor is wall and ceiling insulation. The air conditioning dealer-contractor owes his prospect the

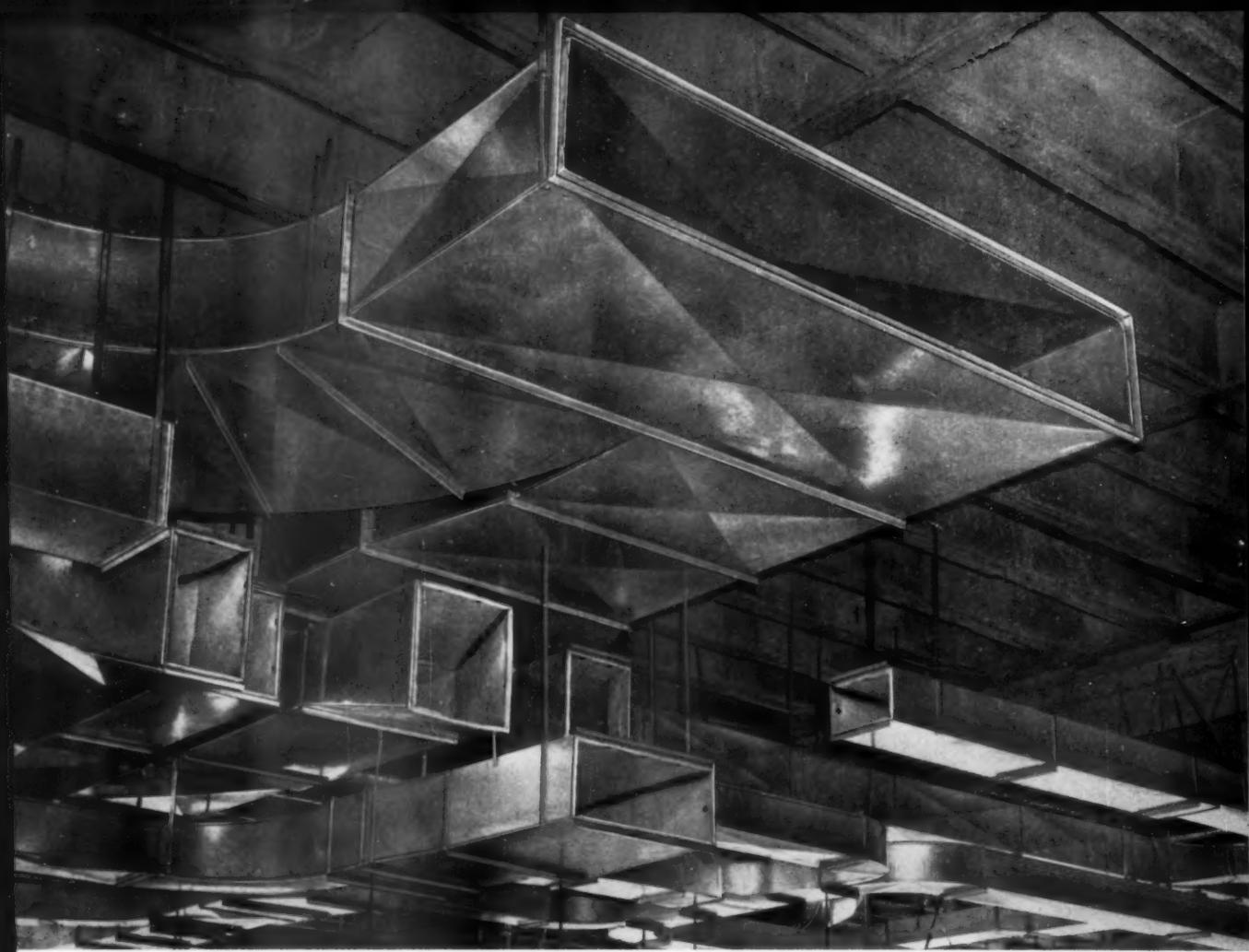
best possible job. If insulation obviously can improve the job by reducing operating costs sufficiently to justify its installation, it should be recommended. The same is true of storm sash.

Spot Moisture Sources

Moisture is another factor. The alert dealer-contractor will recognize unusually large moisture sources such as damp basements which leak considerably during wet seasons. He will also be suspicious of unfinished basements with earth floors which may look dry, but can become inexhaustable sources of moisture (latent load), once an attempt is made to reduce the humidity in the air over them.

Not to be overlooked are such factors as the adequacy of existing power and drain facilities, the need for or desirability of zoning, the refinement of control and even the extent of repair and redecoration necessarily associated with various cooling schemes.

In residential air conditioning work, the customer literally lives with the job performed by the dealer-contractor. To be sure he will be satisfied, as many potential causes for complaint as possible must be anticipated and circumvented, and economies explained before any contract is signed.



All ductwork was fabricated in Dallas by the Straus-Frank Company.

Ductwork made from Galvanized Steel installed in two Dallas Mercantile Buildings



It took 285 tons of galvanized steel sheets to make ductwork to air-condition the recently constructed Mercantile Dallas Building and the eight floors added to the Mercantile Continental Building in Dallas, Texas. An unusual inter-building heating and refrigerated-water air-conditioning system ties these structures to the older Mercantile Securities and Mercantile National Bank Buildings.

About 80% of the ductwork was made from USS Galvanized Steel Sheets. They were selected because of their excellent strength, formability, and zinc adherence.

USS is a registered trademark

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
American Steel & Wire—Cleveland
United States Steel Supply—Steel Service Centers
United States Steel Export Company



United States Steel



So strong you can step
on it, so lightweight you
can carry the longest length!

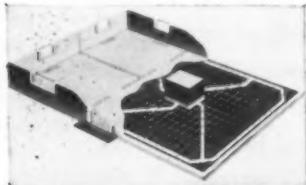
Save time by the hour

*...concrete by the
cubic foot*

Transite Air Duct being installed in
Ridgewood Homes, Inc., Worth, Ill.
Clifford J. Wood, Builder: Brainerd
Heating and Sheet Metal Co., Heating
Contractor.



Taped joints are this easy to make,
right at the job site.



You can readily install Transite Air Duct
as part of the entire heating system.

...with
**easy-to-install Transite Air Duct
for heating and cooling systems!**

Transite® offers you unmatched dollar savings for perimeter heating and cooling systems! Here's why:

First, Transite is light in weight. This means it is easy to truck, stack, and carry on the job. Easy to assemble, too . . . permanent, efficient joints are quickly made with easily applied Ductite® Tape.

NO ENCASEMENT NEEDED

More important, Transite saves substantially in both time and concrete. Transite needs no concrete encasement . . . can be laid directly on the prepared bottom. Transite won't "float". . . needs no special supports or anchoring. Just position ducts and pour concrete . . . Transite won't crush, dent, or deform.

AVAILABLE IN LONG LENGTHS

Installation is still faster and easier because of Transite's long, 10-foot lengths . . . fewer joints to be made to complete the installation. And fittings can be made right on the job . . . simply cut the pipe to shapes desired and tape sections together.

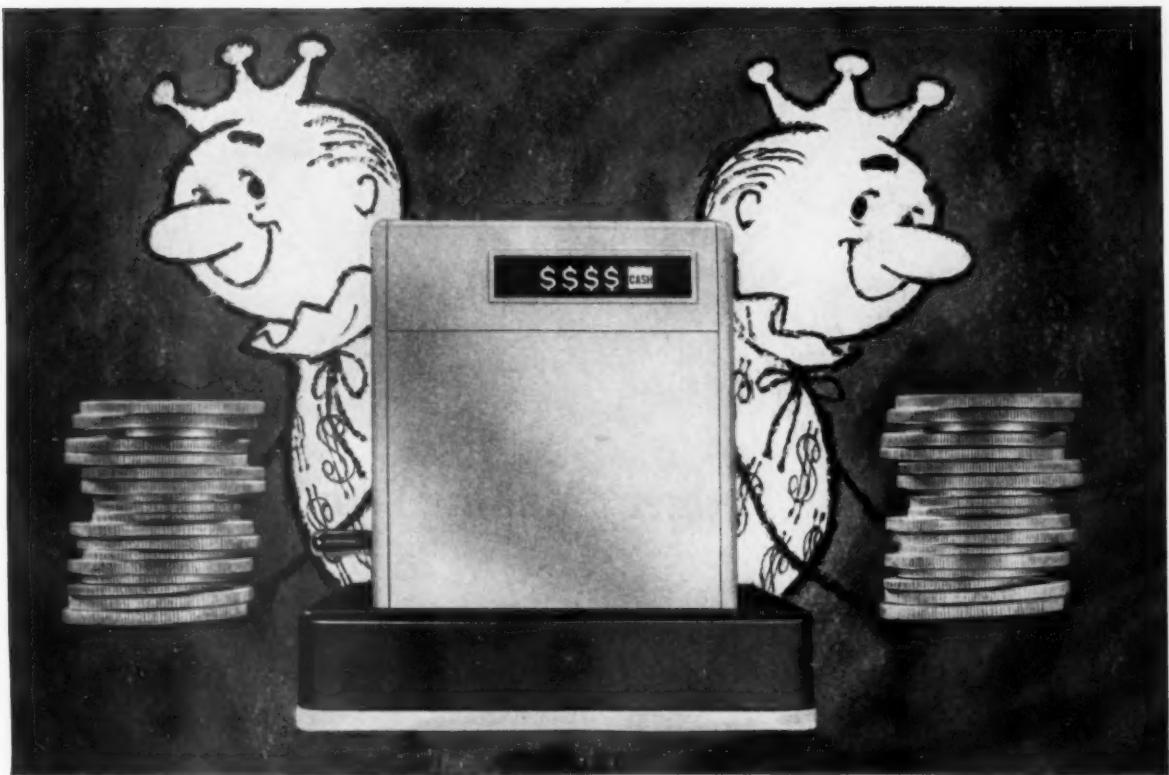
MANY HOME OWNER ADVANTAGES

Transite offers home owners long, trouble-free service. Made of asbestos and cement, it is fully corrosion-resistant inside and out, it won't flake or flap down to impede air flow . . . will never rot or give off odor. For free booklet, TR198-A, write to Johns-Manville, Box 14AA, New York 16, N.Y. In Canada, Port Credit, Ont.



JOHNS-MANVILLE





do you like Money?

**get an
Airtemp
franchise—
and get the
best selling
year in your
history!**

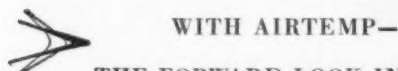
Now is the time to move to get your 1959 Airtemp franchise—now, because exciting new things are coming from Airtemp! New models—a full line—the strongest and hardest-hitting advertising and promotional program in all history! Sign up now, to get more business in 1959.

This page isn't big enough to contain the full story of what the Chrysler Airtemp franchise can mean to you in 1959. These are only some of the highlights:

- Airtemp's trouble-free operation cuts service calls, lets you keep your initial sale profit.
- Airtemp gives you a really *complete* line—297 models. You can satisfy every customer who comes along.
- The prestige of the famous Chrysler name and Chrysler Engineering.
- Sales, engineering, service and business-operation training at Chrysler Corporation Training Centers throughout the country.
- Pre-tested merchandising aids and incentive plans.

CHRYSLER

DO MORE BUSINESS



THE FORWARD LOOK IN AIR CONDITIONING



AIRTEMP DIVISION, CHRYSLER CORPORATION
DEPT. AA-11-S8 DAYTON 1, OHIO

Please send me full information on an Airtemp franchise.

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....



Idea Exchange
for
Dealers, Contractors

Christmas Card 'Ledger' Mailing Wins Customers

PEOPLE HAVE GROWN accustomed to receiving lots of Christmas cards. The exchange of greetings during the holiday season has become so widespread that any oversight in sending cards may constitute an irrevocable social error.

Dealer-contractors are finding that Christmas cards or other holiday remembrances to their customers serve the dual purpose of improving public relations and promoting new sales. Dealer-contractors who go a step beyond the ordinary greeting card find the extra attention often pays handsome dividends in sales leads.

A very effective Christmas gift for customers and prospects has been discovered by Clayton R. Sova, Modern Heating and Ventilating Co., Gloucester, Mass. Mr. Sova sends 5½ × 7½ in. Christmas Card Record books. This piece, which is both a Christmas greeting and a useful gift, costs him approximately 14 cents apiece.

Envelope Extends Greeting

The booklet is mailed in an attractive envelope which conveys the greeting. Inch-high letters in the upper left corner extend the company's wishes for a Merry Christmas. Below the lettering is a gaily-decorated Christmas tree surrounded by gifts. The tree and decorations are printed in the traditional green and red. The company name and return address are imprinted on the envelope flap.

The cover of the Christmas Card Record booklet is red, gold and white. The company name is imprinted in a framed box on the back cover.

Space for Mailing Data

A Christmas verse appears on the first inside page. The following pages are headed alphabetically. Space for 25 names, addresses and mailing data is provided on each two page spread. Beside the spaces for names and addresses are five columns, representing a five year period,



THREE-COLOR Christmas greeting envelope and card record book mailed to prospects and customers produced enthusiastic response and won friends for dealer-contractor

headed "sent" and "received," in which card mailing and receipt dates can be entered for each name on the list.

On his first mailing in 1957, Mr. Sova reported:

"They are unusual, and the response has been far greater than I have ever had from any other promotion item or advertisement. Many people have asked for extra booklets for their friends. In fact, last Christmas was the first time I have not heard 'did-we-send-them-one?' questions being asked in my own home. They can be used almost any season. Names can be entered any time and when Christmas card time rolls around, your list is already made. Being set up for five years, they are a long-lived advertising item."

when time is money

Cost conscious plumbing and heating contractors rely on fast installing AMERIVENT double-wall gas vent pipe. They know that for approved venting of water heaters, furnaces, boilers and space or wall heaters, sturdy lightweight AMERIVENT installs quicker with less labor time.

No waste, cementing or cutting with AMERIVENT. That's why this complete line of snap-together pipe and fittings is first choice for residential and commercial gas venting applications. Contractors know too, that across the U. S. and Canada their local AMERIVENT jobber stands ready to supply their individual requirements.

If you would like to know more about AMERIVENT we invite you to write for a completely descriptive catalog. Address AMERIVENT, Dept. CR.

America's finest double-wall gas vent for residential and commercial use.

AMERIVENT

A Division of American Metal Products Company, Inc.



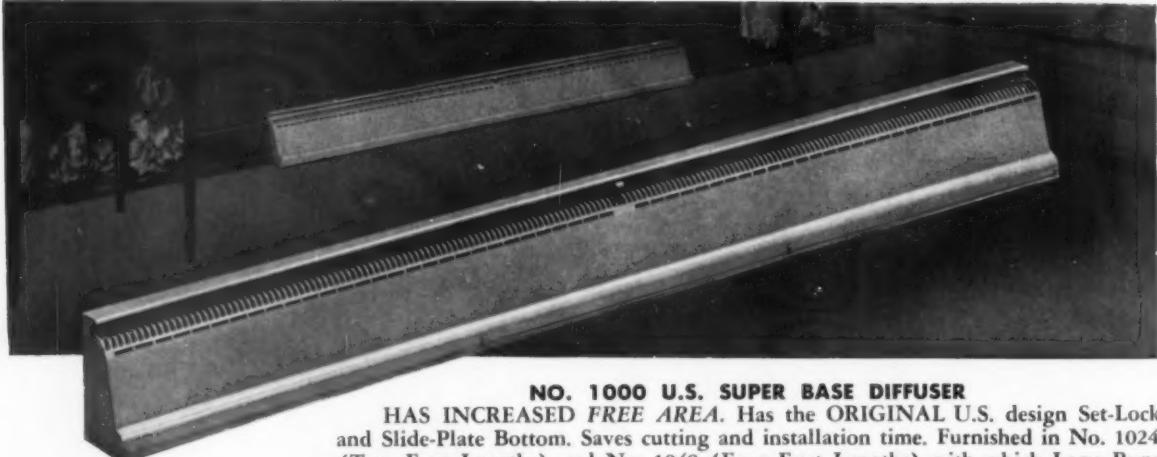
6100 Bandini Blvd., Los Angeles 22, Calif.



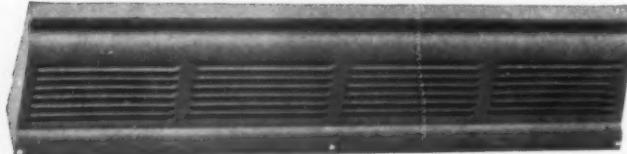


Get your Full Share

of THAT RAPIDLY INCREASING VOLUME OF RESIDENTIAL PERIMETER and CONVENTIONAL AIR CONDITIONING by using THESE BETTER U.S. LINES THAT COST NO MORE and INCREASE SALES



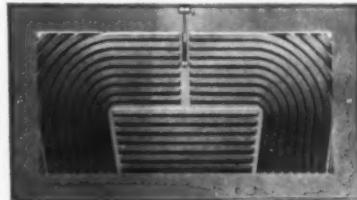
NO. 1000 U.S. SUPER BASE DIFFUSER
HAS INCREASED FREE AREA. Has the ORIGINAL U.S. design Set-Lock and Slide-Plate Bottom. Saves cutting and installation time. Furnished in No. 1024 (Two Foot Lengths) and No. 1048 (Four Foot Lengths) with which Long Runs can be assembled.



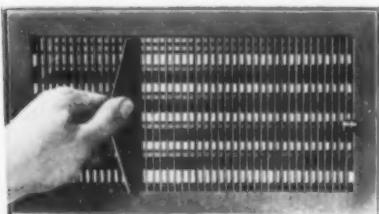
NO. 2000 U.S. PERIMETER INTAKE

MAXIMUM EFFICIENCY—a PERFECT MATCHING INTAKE for the No. 1000 DIFFUSER. Furnished in No. 2024 (Two Foot Lengths) and No. 2048 (Four Foot Lengths) which are easily assembled for the length of run desired.

**NO. 105
U. S.
PERIMETER
SIDEWALL
DIFFUSER**

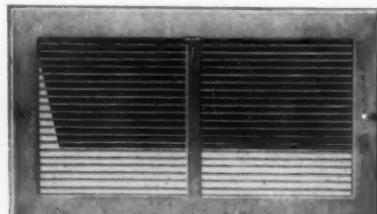


The "Little Giant"! It spreads DIFFUSION a full 180° with the *lowest possible resistance*. May be used with Baseboard Frame for Conversion to a BASE-SETTING—making it possible to carry but one Sidewall Style for both Sidewall and Base Perimeter jobs.



The greatest of all Multi-Valve Air Conditioning Register—The U.S. No. 256.

**AND NOTE!
THESE WORLD-WIDE KNOWN
A-C REGISTERS ARE GOING
BIGGER THAN EVER**



That Single Valve Register—Fits any pocketbook—Fit for a King. The Best for Less—the No. 153.



See U. S. at the International

UNITED STATES

BATTLE CREEK,



REGISTER COMPANY

MICHIGAN, U.S.A.

Branches: MINNEAPOLIS • KANSAS CITY • ALCYNY



Luxaire GIVES YOU A NEW PROFIT PERSPECTIVE

IN
BOTH THE
NEW CONSTRUCTION
AND THE REPLACEMENT MARKETS

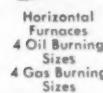
Counterflow Units and Utility Units. Burn either Gas or Oil.



Basement Type Winter Air Conditioning Units. Burn either Gas or Oil.



Gravity Furnaces. Burn either Gas or Oil.



Horizontal Furnaces
4 Oil Burning Sizes
4 Gas Burning Sizes



Gas Duct Furnaces
4 Sizes

Gas Unit Heaters 5 Sizes



Gas Conversion Burners



Combination Year 'Round Air Conditioning Units. 2, 3 or 5 H.P. Air or Water Cooled. Burn either Gas or Oil.



Water Cooled Add On Summer Air Conditioning Units. 3 and 5 Tons.



Air Cooled Add-On Summer Air Conditioning Units. 2, 3 and 5 H.P. Compressor Condenser Assemblies available with Duct or Plenum Type Cooling Coils.

● In the revived and expanding market for new homes — or the rich replacement market — either way, you're money-ahead with Luxaire Heating and Air Conditioning Units!

When bidding for volume installations, Luxaire gives you the price you need — a stable price you can depend on — a low price made possible by converting *cost savings* from more efficient production into *price savings* for you!

When appealing for the one-at-a-time old house job, Luxaire gives you the qualities you need — instant eye appeal, heavier construction, trouble-free performance. At the Luxaire price, these features mean an increased profit for every job!

Regardless of the application, with Luxaire you do not have to choose between an excellent unit and a low price. For Luxaire gives you both!

See your Luxaire jobber today!

Winter Air Conditioner with Plenum-Type Cooling Coil.



Oil Winter Air Conditioner has Factory-Installed Refractory Firebox.



Winter Air Conditioner with Optional Accessory Return Air Cabinet installed.



Assembled...Wired at the Factory

Gas Winter Air Conditioners and Counterflow Units — 75,000, 100,000, 125,000 and 150,000 Btu Input . . . Oil Winter Air Conditioners — 78,400 and 112,000 Btu Output; Counterflow — 78,400 Btu . . . Ready for connection to fuel line, electrical supply, ducts and thermostat . . . 14- and 16-gauge heating elements . . . Available with high air deliveries for year 'round air conditioning!

THE C. A. OLSEN MANUFACTURING COMPANY . . . ELYRIA, OHIO

Luxaire

HEATING & AIR CONDITIONING UNITS

U. S. Laws Prohibit Price Discrimination

**... when it is unjustified by competition, or
when it takes on the characteristics of a monopolistic
move to diminish competition by a show of strength**

SEVERAL YEARS AGO the Federal Trade Commission ordered a dealer to cease and desist price discrimination among customers. The Supreme Court of the United States affirmed the order.

"The legislative history of this statute," the Supreme Court said, "makes it abundantly clear that Congress considered it to be an evil that a large buyer could secure a competitive advantage over a small buyer solely because of the large buyer's quantity-purchasing ability."

Is Lower Price Justified?

"The Robinson-Patman Act was passed to deprive a large buyer of such advantages except to the extent that a lower price could be justified by reason of a seller's diminished costs due to the quantity manufacture, delivery or sale or by reason of the seller's good faith effort to meet a competitor's equally low price."

"Since a grocery consists of many comparatively small articles, there is no possible way effectively to protect a grocer from discriminatory prices except by applying the prohibitions of the Act to each individual article in the store."

Price War Kills Business

When a southwestern dealer threatened to move his business to another town, local residents agreed to give him the exclusive trade of the com-

munity in exchange for his promise to stay.

Declaring such action to be a boycott, his competitor — one of a combination of interlocking corporations with plants throughout the southwest — cut the prices of its goods in half in that area only. After eight months, the dealer who was backed by the goodwill of the community was forced to close out. He brought suit against the larger company, seeking damages for alleged violation of the federal statute against price discrimination to lessen competition.

Apply Antitrust Law

The case came finally before the United States Supreme Court for review. Holding this 50 percent reduction in price a violation of the statute, it awarded the injured dealer damages.

"We think that the practices in the present case are also included within the scope of the antitrust laws," the court ruled. "We have here an interstate industry increasing its domain through outlawed competitive practices."

Find Traits of Monopoly

"The treasury used to finance the warfare is drawn from interstate as well as local sources which include not only this company but also a group of interlocked companies engaged in the same line of business.

And the prices on the interstate sales both by this company and by the other companies are kept high while the local prices are lowered. If this method of competition were approved the pattern for growth of monopoly would be simple.

Price cutting is covered in state and federal laws with which dealer-contractors should be familiar. This is the third in a series of four articles dealing with this important subject. The two previous articles discussed state laws affecting price cutting.

"It is, we think, clear that Congress by this statute, barred the use of interstate business to destroy local business, outlawing the price cutting employed by this dealer."

Distinguishing between illegal price cutting and that which is merely incident to competition, the federal appellate court said:

"It is not every discrimination that is unlawful. Congress knew that all discriminations might have some effect upon competition but Congress was not dealing with the minor effects of discrimination. The discrimination had to be such that it substantially affected competition."

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

66

Look...we've got to sell the heating and air conditioning, too.

And we can start by putting quality where it shows.

We put about 25 thousand into these places now, and most of it doesn't show. About all we've got to work with is the brand names we can merchandise. Look at the money we've put into heating and air conditioning — and the only part of it the buyer will probably ever see is the thermostat. That's why I think we need something to talk about — like this job* or General's new round**. That Decor feature I've heard about is something we can tie into our story on color styling — and it'll give our guys at least one thing they can talk to the little woman about that's not stuck out in the kitchen.

It's the only thermostat I've seen yet that gives you something to really talk with. Let's check out the prices and see how much the same basic units will cost*** if we specify these thermostats.

99

* General Controls famous Tempotherm 365: an electric clock controlled, automatic day-nite, combination heating and cooling thermostat. Hand-wound models also available.

** That's the new General Controls T-190. Face plate can be covered with wall covering — paper or paint — to suit individual preference. Combines new look with mercury switch dependability.

*** Surprisingly little. Both are competitively priced — yet offer exclusive features. Check your wholesaler or local General Controls branch office for full information on America's most complete line of room thermostats.



GENERAL CONTROLS

Manufacturers of America's Finest Automatic Controls
for Home, Industry and the Military

Glendale, Calif. • Skokie, Ill. • Guelph, Ontario, Canada

Six Plants—42 factory branch offices serving the United States and Canada





Brings You Orders Over Your Telephone:

Ask Your Distributor To Tie You In, Today!

Your Telephone Number
Ties You In
To The Ads Above!



Don't Miss One Order; Enroll Today!



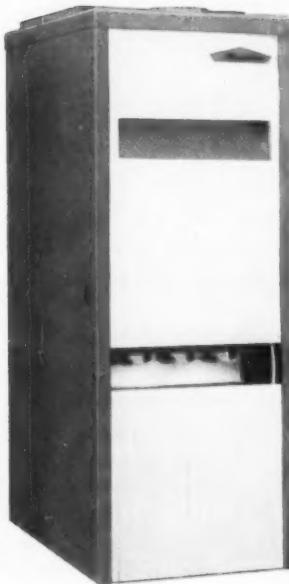
Viking Air Products is now spending \$100,000 to bring you consumer telephone orders for Viking Humidifiers and Viking 20-year Air Filters.

Newspapers! Magazines! Publicity! Point-of-Sale!

Everything's geared to get you orders over the phone. No sales calls! No estimates! No extra work! Be sure you're enrolled today; your Viking Distributor has complete details.

VIKING Air Products 5601 Walworth Avenue • Cleveland 2, Ohio

NEW new NEW *Majestic* GAS LINE for '59*



A whole new series of gas furnaces
—upflow, downflow and basement
models—for natural and LP gas!

*with
features
that
SELL!*

- Rugged, 16 gauge heat exchanger —up to 40,000 BTU's per section!
- Striking new "Grey-Tex" baked-on silicon base enamel finish!
- 22 Gauge Casings with "Quiet-Cote" protection!
- Quiet, efficient, cast-iron slotted-port burner!
- Belt-driven blower assembly removable on handy track!



*DOZENS OF DIFFERENT FURNACE APPLICATIONS

This is the long, strong line for '59! Majestic's new all-gas furnace line includes upflow, downflow and basement models—5 capacities and 3 casing sizes in each model—for LP and Natural Gas.

All units in the new line have the most important sales-winning features in today's warm air heating industry.

The rugged 16 gauge heat exchangers, with up to 40,000 BTU'S per section, are made of *pre-stressed steel* to eliminate "ticking" caused by expansion and contraction.

New "Air-Seal" seams in the casings prevent

heat-reducing air leakage.

For basement models, a versatile return air drop fits either side of the upflow furnace to accommodate filter racks and ducts.

Many limited ceiling installation problems can be solved with the low 57" and 60" converted basement models, achieving up to 160,000 BTU capacity.

Many other reasons will explain why Majestic's new all-gas line is the line to bring MORE SALES. Investigate and you'll agree—it's the SELLINGEST LINE for '59! Send for catalog sheets.

The **Majestic** Co., Inc., 394 Erie Street, Huntington, Indiana

WHAT THE ASSOCIATIONS ARE DOING

Milwaukee Survey Discloses Wide Variations In Pricing, Selling Procedures

RESULTS OF A SURVEY on pricing and selling procedures in the warm air heating field in the Milwaukee area were presented at a recent meeting of the Sheet Metal Contractors Association of Milwaukee, Inc. The survey, conducted without the members' knowing that the project was underway, was made with the aid of a general building contractor, who sent out blueprints of a house to 10 warm air dealer-contractors and asked that they submit bids on a heating system. The building contractor kept a record of the bids submitted and also of the manner in which the 10 contacted dealer-contractors responded to his request.

The bids submitted, as the table on this page shows, ranged from \$755 to \$1200. Those surveyed also differed widely in their selling procedures, as is shown in the following summary of their responses. (The numbers one to 10 in the table, relating each respondent to the bid he submitted, correspond with the numbers in this summary.)

Bidder No. 1 — Itemized his bid. Warm air outlets and return air intakes were listed but not sized. No mention was made of performance. Bid was mailed.

Bidder No. 2 — Called twice in person. Recommended gas. Mentioned all connections for air conditioning. Quoted on three furnaces and gave performance of each. Registers were not described.

Bidder No. 3 — Made no selling effort. Seemed cocky, sure of getting the job. Registers were not described.

Bidder No. 4 — Made good impression as businessman. Registers were not described.

Bidder No. 5 — Quoted several alternates but did not say why one was better than another. Price shown is lowest submitted.

Bidder No. 6 — Returned plan with no comment. Registers were not described.

Bidder No. 7 — Returned plan with no comment. Registers were not described.

Bidder No. 8 — Had an easy, friendly manner. Built his sales story around ease of maintenance. Registers were not described.

COMPARATIVE BIDS as submitted by 10 warm air heating dealer-contractors show wide variations in procedures

Bidder	Price	Size of Furnace	Humidifier	Wiring	Gas Piping
1	\$1200	135,000 Output	Yes	No	?
2	899.949	100,000-120,000 Input	Yes	?	?
3	880	120,000 Input	?	No	No
4	858	105,000 Input	Yes	No	No
5	795	Style shown, no size specified	Yes	Quoted Separately	
6	770	100,000 Input	Add \$15	No	No
7	755	110,000 Input	Yes	No	No
8	755	105,000 Input	Yes	?	?
9	—	—	—	—	—
10	—	—	—	—	—

Bidder No. 9 — Was evasive, somewhat sassy. Said, "Come to our office and we'll go over the plan."

Bidder No. 10 — Did not respond. Apparently was not interested.

One bidder specified how much free service was included in his bid and one briefly mentioned the air distribution system. The home owner says the contract was placed with Bidder No. 2 because his was the best sales presentation and he seemed to have the best knowledge of business.

Several well-qualified industry people had been asked to prepare bids on this job to determine what would have been a reasonable bid price. The figure agreed upon was \$856.86.

Presentation of this data was followed by a floor discussion of ways and means whereby dealer-contractors as an association could develop:

- 1) A better knowledge of the heating business.
- 2) A good sales training course.
- 3) Training in overhead and costs.
- 4) A program of public information.

All of the recommendations presented at the meeting have been referred to the association's warm air heating and air conditioning committee so that it can study the various suggestions made and outline a program for the association to follow.

(More association news on page 90)

Meet the new Peerless

DIXIE AIRE



...a refreshingly new and advanced
line of sectional gas furnaces with extra
large blower capacity, designed
especially for use with air conditioning

LOTS AND LOTS OF AIR—3 models now...more to come

60,000 Btu input—1200 cfm at 0.5" ESP

85,000 Btu input—1600 cfm at 0.5" ESP

115,000 Btu input—2000 cfm at 0.5" ESP

SOMETHING BETTER IN HEAT EXCHANGERS

Sectional steel combustion chambers of advanced "Airfoil" design . . . Spaced on 4½" centers with 2¼" minimum clearance to insure ample air flow and efficient heat transfer . . . New improved ribbon-type burner.

YOU AND YOUR CUSTOMERS WILL LIKE THIS:

- Cabinet finished in pleasing new copper tone color with decorator-styled chrome trim.
- Year-round thermostat for heating and air conditioning.
- Close-clearance approved for closet installation.
- Belt-driven blower.
- Trouble-free V-81 Honeywell silent gas valve.
- Proved and approved by actual in-the-home installation.
- Approved by the American Gas Association.

THE **CHALLENGER**

...a lower priced companion line that's a "natural" for home builders. Same Btu inputs as Dixie Aire but somewhat lower CFM ratings. V-81 Honeywell silent gas valve and a standard heating thermostat. Same copper tone finish, less chrome trim.

PRICES? You'll be pleasantly surprised and pleased.
See your Peerless Distributor or write us.

PEERLESS

C O R P O R A T I O N

1853 LUDLOW AVE., INDIANAPOLIS 7, INDIANA

SEE YOUR PEERLESS DISTRIBUTOR, YOUR ONE-STOP HEADQUARTERS FOR HEATING, AIR CONDITIONING AND HEAT PUMP EQUIPMENT . . . ELECTRONIC AIR FILTERS . . . PIPE, FITTINGS, REGISTERS AND GRILLES.



*"Every now
and then
I miss a good one!"*

In the new construction market, **DODGE REPORTS can uncover them for you**

Have you ever figured the cost—in salesmen's time and missed opportunities—of blind sales calls and calls based on rumors? In some fields, it's the only way of getting business. But not in the new construction market! Not when you can use *Dodge Reports* to pinpoint active prospects...to guide the timing of sales calls...to help you concentrate on the jobs you know will be profitable.

Dodge Reports tell in advance who is going to build what and where, tell you who to see, when bids are wanted—even who else is bidding and who finally gets the job. You specify the area, types of jobs, and stages of progress you want to cover. Reports are mailed daily direct to you or your salesmen. *Dodge Reports* will cover all types of construction for you anywhere in the 37 Eastern States.

WRITE FOR FREE BOOK

F. W. Dodge Corporation, Construction News Division,
119 West 40th Street, New York 18, N. Y., Dept. 16118

Send me the book "Dodge Reports—How To Use Them Effectively" and let me see some typical Dodge Reports for my area. I am interested in the general markets checked below.

House Construction General Building
 Engineering Projects (Heavy Construction)

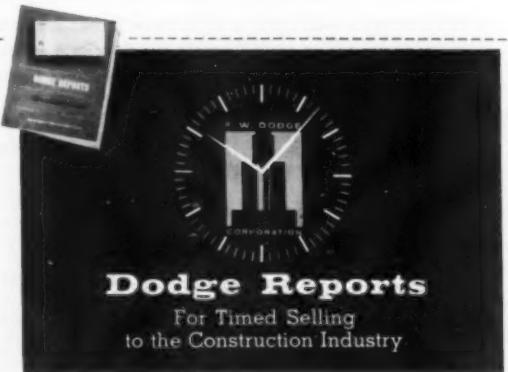
Area _____

Name _____

Company _____

Address _____

City _____ Zone. _____ State _____



More to Sell*

with



* HIGH CAPACITY

* POSITIVE CONTROL
(By Humidistat—Set It, Forget It)

* AUTOMATIC OPERATION
(Furnishes Exact Humidity Needed—
But Only When Needed)

PLUS! BACTERIA REMOVAL

Now...you have even more to sell with Aprilaire Humidifiers!

The unique operational advantages of this newest principle of automatic humidification now includes an outstanding and revolutionary first—**BACTERIA REMOVAL!**

Up to 70% of all bacteria is removed from the air stream passing through the Aprilaire...and this new and vital health feature is a premium benefit to offer your customers.

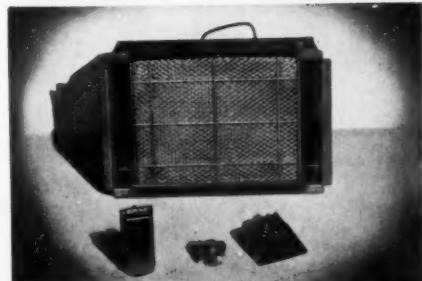
And the Aprilaire's many other features—positive control, high capacity, constantly maintained proper relative humidity—all add up to better health, greater comfort and economy. For more to tell...and sell...it's the Aprilaire!

SEND IN COUPON FOR
COMPLETE INFORMATION



RESEARCH PRODUCTS Corporation
MADISON 10, WISCONSIN

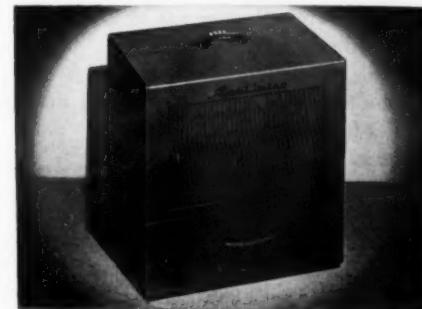
3 NEW MODELS!



PLENUM MODEL — for forced air furnaces. Easily mounted on warm air bonnet. Uses plenum heat for evaporation — furnace fan and ducts for distribution of humidified air. Two models available — Model 110 with capacity of 5.3 lbs. of water per hour; Model 112 (New) with capacity of 9.2 lbs. water per hour.



UNIVERSAL MODEL — installed on or between joists in basement or crawl space. Flexibility of installation permits baseboard or wall registers. Heat source — steam or hot water. Capacity up to 9 lbs. water per hour.



PORTABLE MODEL — No installation necessary. Ideal for offices, apartments — wherever a permanent installation is not desired. Push-button control for high or low humidification, heating or fan only. Capacity up to 4.3 lbs. water per hour. Humidistat is optional equipment.

RESEARCH PRODUCTS CORPORATION
Dept. 81, Madison 10, Wisconsin

I'm interested in the Aprilaire. Send me more information including literature, prices, specifications and the profit-making proposition.

CO. NAME _____

ADDRESS _____

CITY _____ STATE _____

BY _____

WITH THE ASSOCIATIONS

(Continued from page 86)



NEW CHAMPION of the Chicago Warm Air Golf Association, Jerry Anderson (center), receives congratulations from 1957 champion, Otto Zeman. Association president George Anderson (right) waits to add his best wishes.

Golf Group Holds Final Tournament

DEALER-CONTRACTORS and other industry people in the Chicago area recently met at the Ruth Lake Country Club for the Chicago Warm Air Golf Association's final tournament of the 1958 season. The association awarded its annual trophy, an engraved silver loving cup, to Jerry Anderson, Anderson Heating Co., who turned in the two lowest net scores for the three tournaments.

Mel Jackson, Wolverine Tube Co., past president of the association, was the guest of honor for the day. Mr. Jackson came in from Dayton, site of his present assignment, to attend the meeting.

A prize for low gross score was won by William O'Connor, who turned in a 74. Other prizes went to:

Mel Jackson, Wolverine Tube Co.
Otto Zeman, Barney Olson, Inc.
Len Miller, Austin Sheet Metal Works
Babe Frick, Robinson Furnace Co.
Harold Hansen, B-W Furnace Supply Co.
Ray Hubbs, B-W Furnace Supply Co.
R. Shake, Arrow Petroleum Co.
George Bunt, Jones Heating & Air Conditioning
Hugh Russell, guest, Jones Heating & Air Conditioning
Lars Schulein, L. E. Schulein Co.
Glen A. Constantino, Glen A. Constantino Co.
Larry Ingham, Aire-Flow Heating and Air Conditioning Co.
Charles R. Bennett, Warren Barr Supply Co.
George Anderson, Condensation Engineering Corp.
Paul Fetzek, Rheem Mfg. Co.

Ads Aimed at Modernization Market

THE NORTHERN CALIFORNIA Warm Air Heating Institute recently completed a series of magazine and newspaper

advertisements directed at California home owners. Discussing possible flaws in existing heating systems, the institute pointed out, in quarter page advertisements, that "nine out of 10 homes are improperly heated."

The institute is using a color motion picture starring West Coast television personalities at meetings and home shows. Called "The Case of Missing Comfort," the film describes the search made by a "heat detective" for the type of indoor comfort every home owner is looking for.

New England Hears Oil Heat Talk

I. M. NELSON was the speaker of the evening at the October meeting of the Sheet Metal and Air Conditioning Contractors Association of New England, which was open to sales and service personnel of non-member firms as well as members of the association. Mr. Nelson, national field representative of the Boston Machine Works Co., discussed "The Proper Combustion of Oil" and "How to Sell Oil Heat to the Home Owner." Covering all phases of a good installation, he dealt with such points as how to fire a furnace properly; proper material, size and shape of combustion chambers; when and how to use baffles; importance of draft control; nozzle selection; air patterns; and pulsation. The second part of his talk was devoted to techniques in selling oil heat installations. A question and answer period gave members and guests an opportunity to ask Mr. Nelson's advice on special problems encountered in selling and servicing oil heat installations.

Distributors Elect Officers

A. B. LEWIS, Palmer-Donavin Mfg. Co., was elected president of the National Association of Sheet Metal Distributors at the group's recent annual convention. Vice presidents elected are J. J. Worley Jr., N. B. Handy Co., and Robert W. Mason, McDermid Bros., Ltd. Members of the executive committee elected for terms expiring in 1961 are Munroe Best, W. H. Best & Sons, and James F. Kline, Kinsner Supply Co.

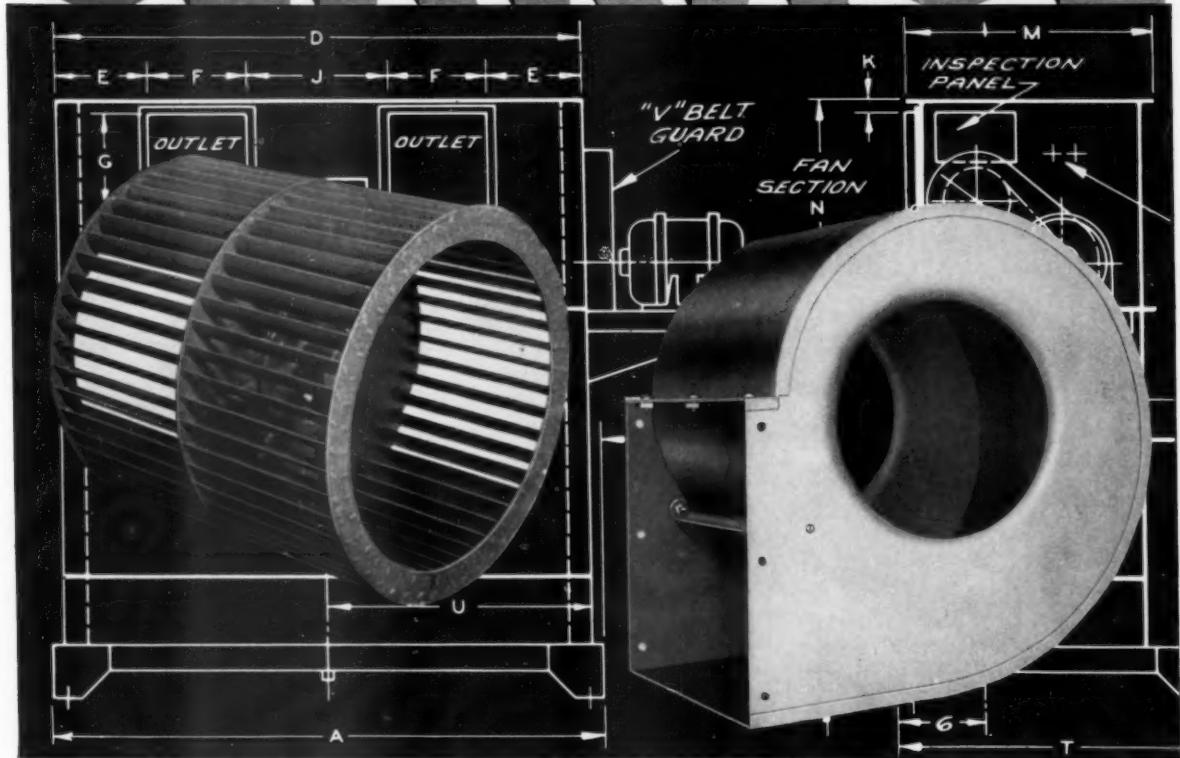
NYC Group Adopts Code of Ethics

THE ROOFING and Sheet Metal Crafts Institute, Inc. (New York City) has adopted a code of ethics prohibiting misrepresentation in advertising and selling. The code, applicable to all local level members, will be enforced by the institute's board of directors. Infractions of the code by any member will result in suspension of institute membership.

According to Gilbert Faye, executive director of the institute, many property owners "have been frightened away from spending for sheet metal and roofing improve-

(Continued on page 94)

CLARAGE



Proved answer to high pressures

MANUFACTURERS: Clarge Type DF fan equipment has what it takes! Wheels and housings or complete fans are available in several designs for pressures up to 8". Note these distinguishing features:

- Individual blades are *riveted* to the rim and backplate.
- A large flange on the *cast iron* hub gives added rigidity to the rugged centerplate.
- *Heavy gauge* steel is used for the housing.
- Streamlined housing inlets, wheel blades that are die formed, and precision wheel

balancing on special machines assure efficient, quiet performance.

- Wheels and housings can be hot dipped galvanized for protection against severe moisture conditions.
- Spark-resistant aluminum wheels and other special features and constructions are also available.

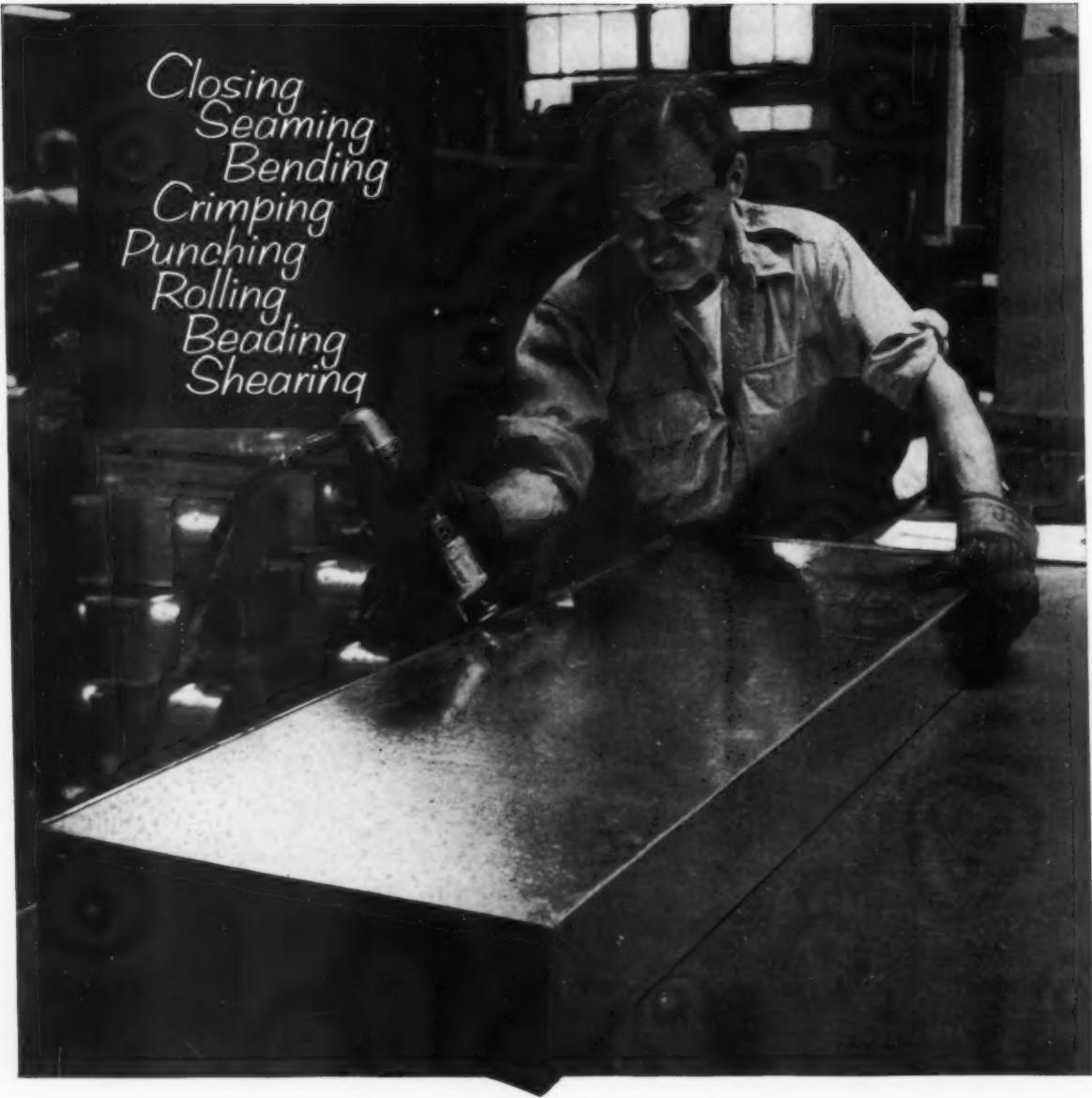
Give your products increased saleability. Incorporate Clarge quality—*known* quality that has *proved* its worth to other leading manufacturers.

Dependable equipment for making air your servant

CLARAGE FAN COMPANY

Kalamazoo, Michigan

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal



... The zinc holds tight on a Bethcon sheet

Put it through the toughest operation in your shop . . . a Bethcon galvanized steel sheet will do all you ask of it. The coating comes through intact as the sheet forms up into a strong and rigid finished product.

Bethlehem's continuous galvanizing process includes a special annealing cycle which gives the basic steel sheet its ideal blend of strength and ductility. Moments later, the zinc is applied, and applied so tightly that it permits forming never before considered practical for galvanized steel. You really ought to try Bethcon for yourself in order to

fully appreciate its true advantages. It is available in both cut lengths and coils, in gages 12 and lighter, with either plain open hearth or copper-bearing (Beth-Cu-Loy) steel for the base metal. A Bethlehem representative will gladly work with you in running some tests. Just get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Stitching cuts duct insulation costs 80%

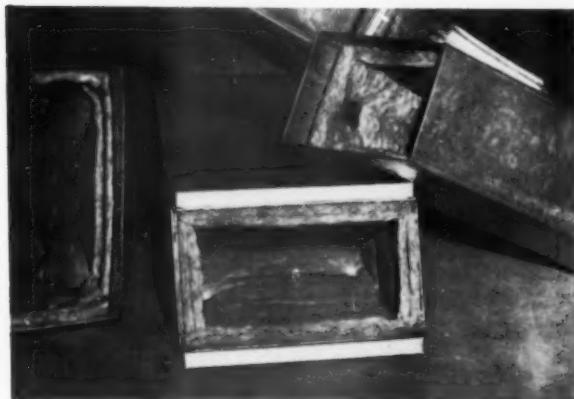
On-the-job photos show how Bostitch stitcher cuts time, improves results



1. Men cut glass fiber insulation to size. Two-man crew handles insulating job with ease.



2. Bostitch S25C Stitcher fastens insulation to sheets of duct metal. Stitches of #18-290 wire with $\frac{3}{16}$ " crown are driven through tinsmith's roofing buttons, insulation, and metal of 26, 24, 22 or 20 gauge. 25" stitcher throat takes sheets up to 4 feet wide. Four stitches are driven to every square foot.



3. Finished ducts with stitched insulation yield cost saving of 80% compared to ducts with cemented insulation. And there is the extra safeguard of positively secure fastening. Unlike cement, metal stitches are as durable as the materials fastened. Age, temperature changes, climate and chemical action do not affect the holding power of Bostitch stitches.

Cementing, riveting, bolting, spot welding, clips — which do you use? Let us show you how Bostitch metal stitching may cut your fastening costs from 50% to 90%. A Bostitch Economy Man — one of 350 working out of 123 U. S. and Canadian cities — will show you how to save time and money on your fastening jobs. He's listed under "Bostitch" in your telephone directory. Or, you can send in the coupon below.

Fasten it better and faster with



Bostitch, 951 Briggs Drive, East Greenwich, Rhode Island

Please have an Economy Man call on me.
 Please send me information on fastening sheet metal.

We presently use (please check)
 Riveting Spot Welding Crimping Cementing

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

WITH THE ASSOCIATIONS

(Continued from page 90)

ments because of the unscrupulous acts of a few companies. The code, copies of which will be sent to all members for display purposes, will serve to assure property owners that dealing with institute members will not be regretted."

The following stipulations are included:

- 1) Only those sheet metal and roofing improvements which are structurally and economically sound shall be encouraged.
- 2) All advertising statements shall be accurate.
- 3) Accuracy shall be required of all dealer-contractors in their descriptions of sheet metal and roofing products and services.
- 4) All contracts employed shall be unambiguous and fair to all parties concerned.
- 5) All contractual obligations shall, within reason, be promptly fulfilled.
- 6) All work shall be performed in a manner compatible with recognized standards of public health and safety and applicable laws.

Alabama President Appoints Committees

HARRY H. HAHN JR., president of the Roofing, Sheet Metal, Heating & Air Conditioning Contractors' Association of Alabama, has appointed the following standing committees for the 1958-59 year:

Legislative — Wallace G. Stanfield (chairman), Redus W. Brooks, J. Tony Persons, W. B. Simmons, Earl Shelton.

Membership — Dennis F. Monroe (chairman), H. A. Oberlies, S. E. Palmer, F. W. Ballard Jr.

Insurance — James H. Pearson (chairman), H. R. Chisenhall, Redus W. Brooks, B. L. Young, B. E. Hathcock.

Publicity — Herbert H. Lane (chairman), Larry Cain, R. S. Keith, J. H. Smith Jr., Virgil Rawson.

Advisory — Herbert R. Chisenhall (chairman), Art Thys, W. Gene Gwin, Elmer D. Russell.

Apprenticeship — Emory R. Cunningham (chairman), Dennis F. Monroe, Bill M. Wright, S. E. Palmer.

Sponsors Air Conditioning Course

THE SAN MATEO COUNTY (California) Sheet Metal & Heating Contractors Association is sponsoring an air conditioning course at the Junior College of San Mateo. Instructor is Roland R. Taylor, application engineer for Fraser & Johnston Co. of San Francisco.

Rochester Group Hears Ventilating Talk

THE DESIGN AND INSTALLATION of a small ventilating system was the subject under discussion at the October meeting of the Master Sheet Metal, Furnace and Roofers Association (Rochester, N. Y.). The speaker, a representa-

tive of a fan company, went over all details of an installation suitable for use in restaurants, tailor shops, bakeries or similar operations.

The association's committee on telephone book advertising recommends that members limit their advertising to the following classifications: 1) Sheet Metal Work; 2) Heating Contractors; 3) Air Conditioning Systems; and 4) Insulation Contractors.

Kalamazoo Speaker Discusses Service

SPEAKER OF THE EVENING at the October meeting of the Kalamazoo Heating & Air Conditioning Association was Dick Martelle, Reliable Air Conditioning Sales & Service, Inc. Mr. Martelle, assisted by his father and brother, discussed the subject of "Service for Profit."

OHI Chapter Offers Service to Builders

THE OIL HEAT INSTITUTE OF WASHINGTON is mailing a special "OHI Newsletter" to Pacific Northwest builders, real estate agents, architects and others in the building industry. Purpose of the news letter is to keep builders informed of the chapter's public relations and advertising programs promoting modern oil heating so that building groups may take full advantage of promotional material available. Chapters and dealer-contractors interested in knowing how the campaign is being handled may write to Bob Elmslie, managing director, Oil Heat Institute of Washington, 400 Dexter Ave., Seattle 9.

BHCB Launches Consumer Campaign

THE BETTER HEATING & Cooling Bureau, Detroit, has prepared a mailing piece that tells the home owner what to look for in a central warm air heating system. Questions asked include: Is the thermostat centrally located? Is there a warm air outlet in every room? Are the air grilles located properly and are they of proper size? Is the duct-work neat and well-insulated? Is there an adjustable damper in each duct that leads to a warm air outlet? Is the furnace sized according to the Btu heat loss of your home? Is the furnace room well ventilated?

Final questions, dealing with the installer, ask: Is the heating dealer-contractor an experienced, reliable firm? Is his name posted on the furnace so you'll know whom to call for service? Will he guarantee that the temperature differential from head height to slightly above the floor is only a few degrees in cold weather?

Included in the circular is a list of dealer-contractors who are members of the Better Heating & Cooling Bureau. It is pointed out that if a home owner wants a heating system that will meet all the requirements mentioned in the check-list, he should contact one of the firms

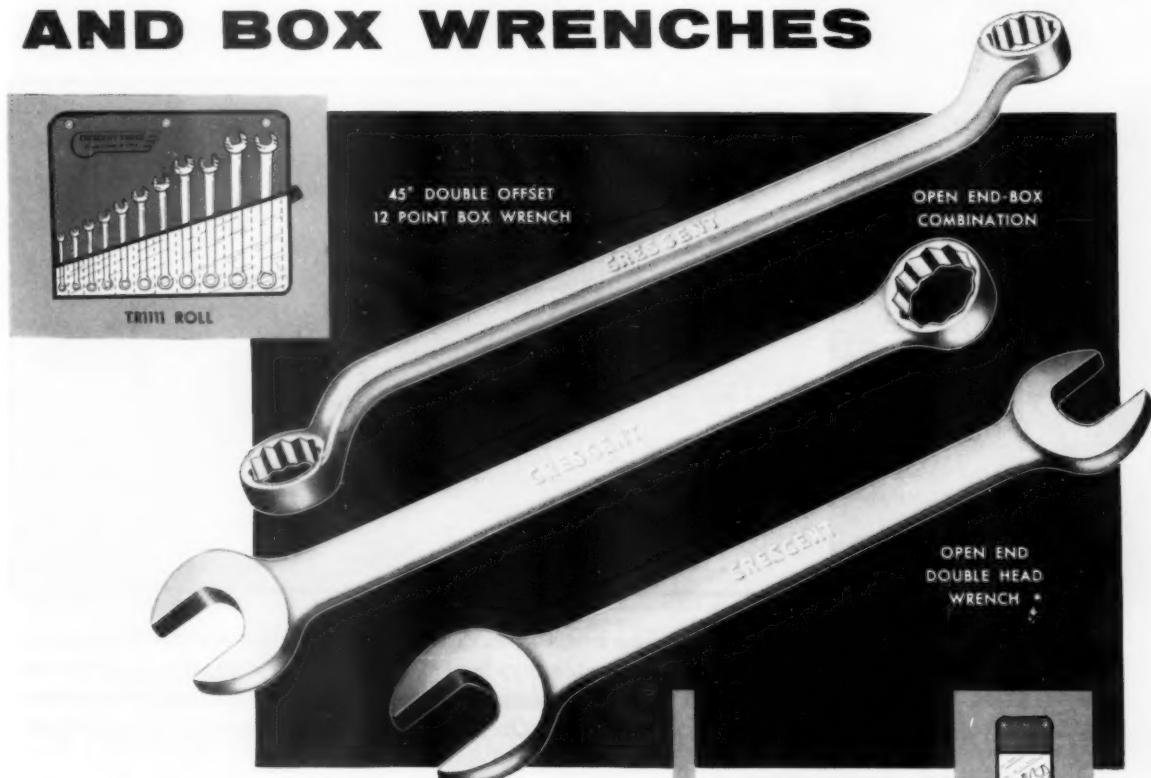
(Continued on page 98)

CRESCE

NT AND BOX WRENCHES



OPEN END

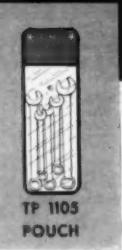


Crescent Open End and Box Wrenches are drop-forged from special analysis alloy steel, precision machined to insure accurate opening sizes, and handsomely finished in chromium plate. These fine wrenches provide world famous Crescent quality at popular prices. Open End Wrenches are available in 13 sizes from $1/4"$ — $5/16"$ to $1-1/8"$ — $1-1/4"$; Combination Wrenches in 14 sizes from $3/8"$ to $1-1/4"$; and Double Offset Box Wrenches in 9 sizes from $3/8"$ — $7/16"$ to $7/8"$ — $1-1/16"$.

Sold by Hardware Dealers everywhere.

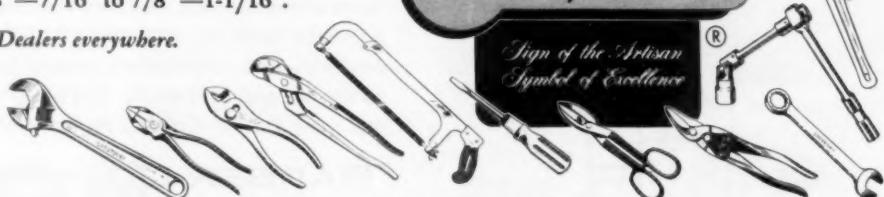
**SOLD SINGLY
OR IN SETS**

Seven kit assortments available in convenient rolls—four in handy pouches. Clear plastic fronts permit quick selection of proper wrench size.



CRESCE
NT TOOLS
Give Wings to Work

*Sign of the Artisan
Symbol of Excellence*



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by
CRESCE
NT TOOL COMPANY, JAMESTOWN, NEW YORK

THE MARK OF QUALITY

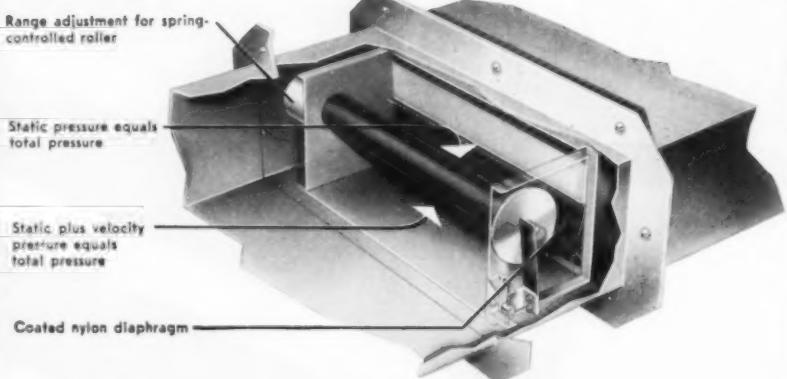


Uni-Flo

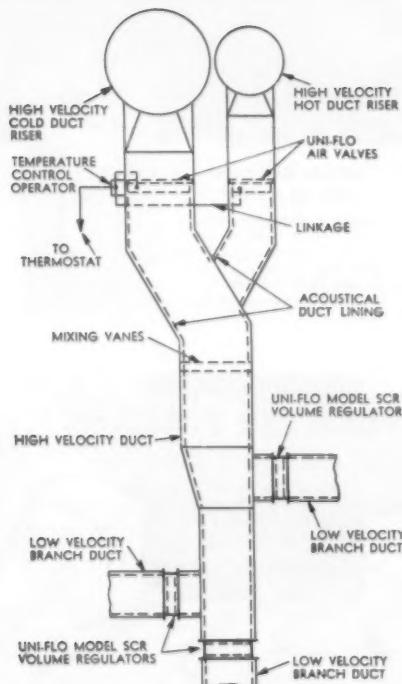
ENGINEERED AIR
DISTRIBUTION

- Maintain cfm delivery within $\pm 5\%$ for inlet air pressure differences as high as 5:1.
- Completely self-contained — requires no power source other than the air flow.
- Fully adjustable before or after installation.

New for high velocity systems! Self-operated Constant Volume Regulator



Barber-Colman Model SCR constant volume regulator



Schematic diagram of SCR constant volume regulators installed in high velocity duct system.

The new Uni-Flo Model SCR constant volume regulator is applicable anywhere in a duct system where there are changes in static pressure. No motor operator or other power source is required. Only requirement for its operation is a minimum of 0.75 inches of static pressure.

As illustrated above, both static and velocity pressure exist under the flexible diaphragm where the air can pass through the baffle plate. Static pressure only exists above the diaphragm where the air is trapped.

A static pressure increase above the diaphragm forces it downward, limiting the open area of the baffle plate. Conversely, when static pressure decreases, the diaphragm raises, exposing a larger opening area. Thus, a constant cfm delivery is maintained regardless of pressure changes in the system.

Here is your simple, positive, economical answer to extremely accurate constant volume control. The Model SCR is also available in a double-duct control unit for direct connection to the hot and cold ducts. For complete details and literature, call your Barber-Colman representative or write today.

BARBER-COLMAN COMPANY

Dept. K, 1106 Rock Street, Rockford, Illinois

Air Distribution Products • Automatic Controls • Small Motors • Industrial Instruments • Aircraft Controls • Electrical Components • Overdoors and Operators Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

AIR CONDITIONING IS PROFITABLE BUSINESS!



• Mr. Schmetzer (left) and assistant charging equipment with "Freon-12" prior to installation. Mr. Schmetzer has been using "Freon" ever since he entered the air conditioning field in 1936. He finds it's always uniform and pure—easy to handle.

"We've built a \$1 million air conditioning business in only seven years—and we've only scratched the surface"

Reports Mr. Louis Schmetzer, President, Louis Schmetzer Company, Heating and Air Conditioning Contractors of Tustin, Calif.

"When we started in business in 1951, we handled air conditioning as a sideline, selling only 20 units," says Mr. Schmetzer. "Today air conditioning accounts for a big share of our total sales. We expect to top \$1 million by a considerable margin in 1958. At the rate this community's growing, we haven't even scratched the surface of the potential for air conditioning in this area."

"Because of our good reputation, much of our new business comes through satisfied customers. We get a lot of business through radio, newspaper and direct-mail advertising, with radio doing the best job for us, and we work closely with local builders and architects on both residential and commercial air conditioning installations."

"Whether we're doing a residential or commercial air conditioning job, we always charge the equipment with Freon® refrigerants. 'Freon' is dry, and we especially like it because it's safe. We think 'Freon' is the most dependable, all-around refrigerant made."

Air conditioning is profitable business—especially when you know who the best prospects are . . . where they are located . . . and how to reach them. Because of Du Pont's market research, this information is available to you free—plus a wealth of technical data on the use, storing and handling of "Freon" refrigerants. And look for the new golden cap on each "Freon" cylinder. It identifies the quality of "Freon"—sealed for purity by Du Pont.

For more information, contact your complete air conditioning and refrigeration wholesaler or write: E. I. du Pont de Nemours & Co. (Inc.), "Freon" Products Division 1711 Wilmington 98, Delaware. Sales Agents: Ansul Chemical Co., Marinette, Wis., and Virginia Smelting Co., West Norfolk, Va.

Always ask
for "Freon"
from the
wholesaler
who displays
this sign . . .



FREON® premium quality refrigerants

*Freon and combinations of Freon- or F- followed by numerals are Du Pont's registered trademarks for its fluorinated hydrocarbon refrigerants.

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

WITH THE ASSOCIATIONS

(Continued from page 91)

listed, because these companies "are pledged to install warm air heating systems according to the bureau's residential warm air heating code."

OHI Revises Heating Course Syllabus

The Oil Heat Institute of America, Inc. has issued a second printing of "Domestic Oil Burner Course," OHI's standard syllabus for teaching oil heat courses in trade and vocational schools. Just prior to its reprinting, the course syllabus was revised by Charles H. Burkhardt, national secretary of the Distribution Div., who wrote the original course when he was chairman of the education committee.

Divided into three parts, the course, as outlined in the

syllabus, covers General Technical Information, Installation Principles and Practice, and Oil Burner Servicing.

The Technical Information section is broken down into fuels, combustion, draft, the oil burner, general heating equipment, heating systems, oil burner components and controls.

Part 2, Installation Principles and Practice, covers combustion chamber installation and design, procedures for installing furnaces, smoke pipe and draft control installation, and the setting and installing of the oil burner.

Part 3 covers servicing of various types of burners in current use, emergency repair of oil tanks, combustion and efficiency testing, and the causes and cures of high oil consumption.

(More association news on page 102)

Coming Events

December

Dec. 1-3 — National Heating and Air Conditioning Wholesalers, annual convention. Hotel Statler, Cleveland. W. R. Bull, executive director, 1200 W. Fifth Ave., Columbus, Ohio.

Dec. 1-3 — American Society of Refrigerating Engineers, semi-annual meeting. Hotel Roosevelt, New Orleans, La. R. C. Cross, executive secretary, 234 Fifth Ave., New York 1.

Dec. 2-3 — National Warm Air Heating and Air Conditioning Association, committee meetings. Statler Hotel, Cleveland. George Boeddener, managing director, 640 Engineers Bldg., Cleveland 14.

Dec. 4-5 — National Warm Air Heating and Air Conditioning Association, annual convention. Statler Hotel, Cleveland. George Boeddener, managing director, 640 Engineers Bldg., Cleveland 14.

1959

January

Jan. 17-22 — National Association of Home Builders, annual convention and exposition. Conrad Hilton Hotel, Chicago. Daniel Grady, convention chairman, 1625 L St., N. W., Washington 6, D. C.

Jan. 20-21 — Carolinas Roofing and Sheet Metal Contractors Association, midwinter annual meeting and roofing and sheet metal forum. North Carolina State College,

Raleigh, N.C. H. J. Stockard Jr., executive secretary, Box 408, Raleigh, N.C.

Jan. 26-29 — American Society of Heating and Air-Conditioning Engineers, 65th annual convention. Bellevue Stratford Hotel, Philadelphia. A. V. Hutchinson, executive secretary, 62 Worth St., New York 13.

Jan. 26-29 — International Heating and Air-Conditioning Exposition, Commercial Museum, Philadelphia. E. K. Stevens, exposition manager, International Exposition Co., 480 Lexington Ave., New York 17.

February

Feb. 5-6 — Sheet Metal and Warm Air Heating Contractors' Association of Indiana, annual convention. Antlers Hotel, Indianapolis. J. W. Ridgway, president, 53 W. Meredith, Frankfort, Ind.

Feb. 9-11 — New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, annual convention. Arlington Hotel, Binghamton. Clarence J. Meyer, executive secretary, 569 Genesee, Buffalo 4.

Feb. 12-14 — Sheet Metal and Roofing Contractors' Association of Minnesota, annual convention. Radisson Hotel, Minneapolis. Ray Kraus, convention chairman, General Sheet Metal Corp., 508 S. 7th, Minneapolis.

Feb. 16-19 — Annual Industrial Ventilation Conference. Kellogg Center, Michigan State University East Lansing, Mich. James C. Barrett, Michigan Department of Health, Lansing 4, Mich.

(For additional Coming Events see page 102)



Stainless Steel spinning information:



*Before you take a spin—check the oil

Stainless Steels lend themselves readily to cold spinning. When you spin Stainless Steel, be especially generous with the lubricant. Use lubricants with sufficient body to withstand the high pressures and temperatures that may develop. Because of Stainless Steel's superior toughness, greater pressure is required than that used for carbon steel. A good spinning tool is made of hardened alloy steel. It should have a large bearing surface to distribute the pressure as widely as possible.

Spinning Stainless Steel will give you accurate and uniform wall thickness in one operation not readily obtainable in drawing. Certain shapes can be spun more economically than drawn, which may require several operations and heat treatment. Remember, too, that certain types of steel are more adaptable to spinning than drawing.

You'll find that Stainless Steel isn't difficult to spin, it's just different. You can do a top-notch job with ease when you follow our 130-page manual. If you haven't received your free copy, write on your company letterhead for our "Stainless Steel Fabrication Book," United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. *USS* is a registered trademark

United States Steel Corporation - Pittsburgh
American Steel & Wire - Cleveland
National Tube - Pittsburgh
Columbia-Geneva Steel - San Francisco
Tennessee Coal & Iron - Fairfield, Alabama
United States Steel Supply - Steel Service Centers
United States Steel Export Company



United States Steel

"PURCHASED THESE SNIPS IN '39 USED THEM DAILY EVER SINCE!"

*"Wiss Snips outcut and outlast them all,"
says Farquar-Garber Co., Indianapolis, Ind.*



Since 1902, Farquar-Garber Company has been a leader in the field of Heating and Air Conditioning around Indianapolis. And since 1939, they've been using the pair of Wiss Snips shown above daily . . . a pair that was already used when purchased!

Says William Garber: "The craftsmanship evident in Wiss Snips never ceases to amaze me. In an era when so many products seem to wear out almost as if by schedule, Wiss Snips show the durability of Gibraltar. Needless to say, all of our Installers carry Wiss Snips and are constant users of M-1 and M-2 aviation snips."

Based upon the report of Mr. Garber and dozens of similar cases, Wiss has developed an amazing fact: The cost of owning Wiss Snips averages less than 25 cents per year of use . . . makes them by far the most economical snips to purchase. So whether you seek economy or quality, you can't miss with Wiss! Order from your industrial jobber or dealer.



Inlaid ■ Metal-Master ■ Solid-Steel

WISS INLAID BLADE SNIPS cut with lasting sharpness, tremendous power. High carbon crucible steel blades, welded to hot drop-forged frames. Complete range of sizes, 11½" to 17". Models: straight cutting, circular cutting, curved blades, and bulldog notching.

WISS METAL-MASTER AVIATION SNIPS, with amazing compound action, cut with half the effort required by conventional snips! They are preferred by many for their compact size, and ability to make intricate cuts. Left, right and straight cutting models, only 10" long, cut 18 gauge metal. Bulldog combination model, 9½" long, cuts 16 gauge stainless steel!

WISS SOLID STEEL SNIPS, made from a special grade of solid tool steel, are available in straight cutting, circular cutting and bulldog models from 7" to 16". Priced slightly lower than inlaid snips.

Made by Metal Craftsmen for use by Metal Craftsmen

WISS

...always a cut above competition

J. WISS & SONS CO., NEWARK 7, N. J.

World's Largest Manufacturer of Shears, Scissors, Pinking Shears, Skalloping Shears, Metal Cutting Snips and Garden Shears

NOW
AGITAIR®
 REGISTERS
 and
 GRILLES

(formerly STEWART)

Air Devices Inc., has acquired the complete line of STEWART Registers and Grilles to add to job proven AGITAIR Diffusers, Filters and Exhausters...THERMOTANK High Velocity Mixing Boxes and Punkah Louvres.

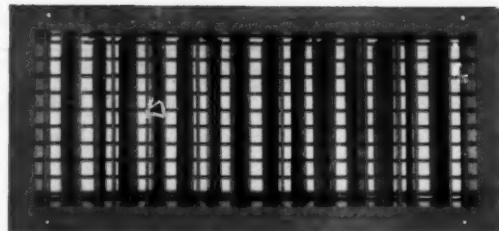
Now from one source, Air Devices Inc., you can select with confidence and specify any AGITAIR product and be assured that the item or items selected will meet every performance and architectural requirement.

All Air Devices Inc. representatives have practical "on the job" experience in the application of Agitair products. They will gladly assist you in the selection, sizing and application of these products.

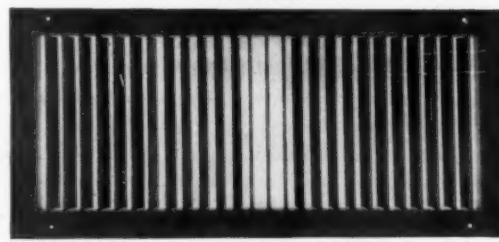
AIR DEVICES INC.

185 MADISON AVENUE, NEW YORK 16, N. Y.

high velocity units • punkah louvers
 air diffusers • filters • exhausters
 registers and grilles



REGISTERS



GRILLES



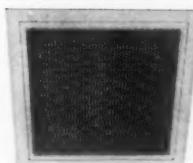
SQUARE &
RECTANGULAR DIFFUSERS



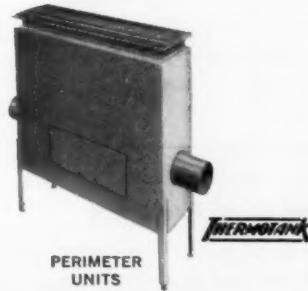
CIRCULAR DIFFUSERS



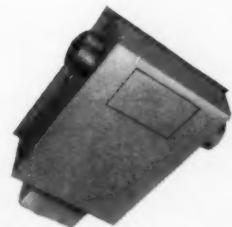
STRIPLINE DIFFUSERS



PERFAIR
PERFORATED DIFFUSERS



PERIMETER
UNITS



CEILING UNITS



DRUM PUNKAH LOUVRES



ROUND PUNKAH LOUVRES



FILTERS



EXHAUSTERS

WITH THE ASSOCIATIONS

(Continued from page 98)

Coming Events

(Continued from page 98)

March

Mar. 2-4 — Ohio Sheet Metal Contractors' Association, annual convention. Mayflower Hotel, Akron. Harry Liberman, general chairman, 580 Wooster, Akron.

Mar. 9-11 — Sheet Metal Contractors' Association of Wisconsin, annual convention. Hotel Schroeder, Milwaukee. Robert S. Schmieder, executive secretary, 8320 W. Bluemound Rd., Milwaukee.

Mar. 19-20 — Michigan Heating & Sheet Metal Association, annual convention. Fort Shelby Hotel, Detroit. N. J. Biddle, executive secretary, 3035 E. Grand Blvd., Detroit 2.

Mar. 19-21 — Southeast Trade Exposition sponsored by Sheet Metal, Roofing, Heating, Air Conditioning Contractors' Association of Georgia. Atlanta Biltmore Hotel, Atlanta. B. L. Noblitt, executive secretary, 208 Red Rock Bldg., Atlanta 3.

April

Apr. 10-11 — Sheet Metal Contractors' Association of Illinois, annual convention. Abraham Lincoln Hotel, Springfield. Jay E. Harms, secretary, 1619 N. Sheridan Rd., Peoria, Ill.

Apr. 17-18 — Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, annual convention. Castleton Hotel, New Castle, Pa. E. W. Liebermann, secretary, 1411 Merchant St., Ambridge, Pa.

Apr. 24-26 — Roofing and Sheet Metal Contractors' Association of Florida, annual convention. Biltmore Hotel, Palm Beach, Fla. Victor Kinsey, president, 1517 N. Poinsettia, West Palm Beach, Fla.

Apr. 29-May 4 — Oil-Heat Institute, annual convention. Olympic Hotel, Seattle, Wash. R. H. L. Becker, managing director, 500 5th Ave., New York 36.

May

May 4-6 — Air-Conditioning and Refrigeration Institute, annual meeting. The Homestead, Hot Springs, Va. George S. Jones, Jr., managing director, 1346 Connecticut Ave., N. W., Washington 6, D. C.

May 28-30 — Sheet Metal and Air Conditioning Contractors' National Association, Inc., annual convention. Broadmoor Hotel, Colorado Springs, Colo. J. D. Wilder, executive secretary, 170 Division St., Elgin, Ill.

Launches Chapter Formation Program

TO ENCOURAGE THE FORMATION of more local chapters, the National Warm Air Heating and Air Conditioning Association of Canada is working on a program designed to increase and improve the services it offers. Plans are now underway to:

- 1) Develop publicity material for local chapter use promoting "Double Seal Heating";
- 2) Develop a new dealer-contractor training program on business management;
- 3) Develop a method of supplying industry speakers for local chapter meetings;
- 4) Prepare a new warm air heating master code and licensing procedure for chapter use at the municipal level.

The association reports that of the 641 delegates who attended the 1958 basic schools, 296 obtained marks of 75 percent or better on the written examination. However, only 196 of the delegates submitted answers to the design problem. Of this group, 131 scored grades qualify-

ing them for certificates. Twenty-seven of the 83 delegates who submitted solutions to the special plan approval problem received marks of 80 percent or better, in recognition of which they received special awards signed by the president of the association.

Elmer Iverson of Fort William obtained the highest overall average in the basic schools. Mr. Iverson's marks were 100 percent in questionnaires 1, 2 and 3, and 91 percent in the design problem. Henry Wong, London, who attended the Toronto school, scored 88 percent in the plan approval problem, the highest mark in that category.

Santa Clara Sponsors Heating Course

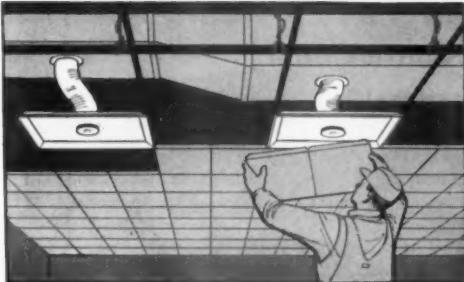
HEATING CLASSES are now being held at San Jose State College under the sponsorship of the Sheet Metal Contractors' Association of Santa Clara County (Calif.). The course covers heat loss and heat gain calculations, use of the psychrometric chart, controls, and distribution of conditioned air. E. L. Miller, a graduate of the University of California, is instructor.

MULTI-VENT®

**low velocity air diffusers
specified for the West's
largest office building**

Multi-Vent will handle the air distribution in over 70% of Kaiser Center's office building, the largest west of the Mississippi, scheduled for completion late in 1959.

Multi-Vent is the ideal air diffuser for office space because it need never be moved, or even adjusted when partitions are relocated. Distributing air at low velocities by gentle pressure displacement, Multi-Vent provides truly sightless, soundless, imperceptible air conditioning comfort, unmatched by any other diffuser.



Multi-Vent panels, adjustable valves and flexible duct connections are concealed in metal pan ceilings because standard perforated pans (with acoustic pads removed) serve as diffuser plates. Panels (with diffuser plate) install flush in plaster and fiber ceilings.



KAISER CENTER, Oakland, California

Architect: Welton Becket & Associates, San Francisco
Mechanical Engineer: Dudley, Deane & Associates, San Francisco
Mechanical Contractor: Scott Company, Oakland

Recent Multi-Vent Installations Coast to Coast

Banker's Trust, New York City
Baptist Tabernacle, Atlanta
Boeing Airplane Co., Seattle
Ford Motor Co., 21 Buildings
Graybar Electric, Illinois
Inland Steel Building, Chicago
National Bank of Detroit, Detroit
Parke Davis Bldg. 64, Detroit
Procter & Gamble Tech. Center, Cincinnati
Prudential Insurance Co., Newark
Travelers Insurance Co., Hartford

Write for detailed literature.

THE PYLE-NATIONAL COMPANY

MULTI-VENT DIVISION

WHERE QUALITY IS TRADITIONAL

1369 N. Kostner Avenue, Chicago 51, Illinois

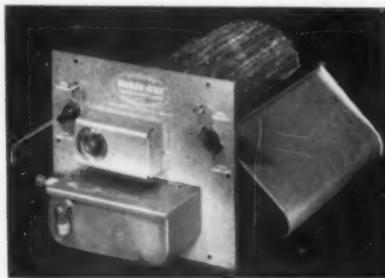
SALES AGENTS IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department

Furnace Humidifier

"HUEDE-AIRE" warm air furnace filter with revolving water-covered screen which extends into plenum—*Walter E. Selck & Co., Inc., Dept. AA, 225 W. Hubbard St., Chicago 10.* Motor driven round phosphor



bronze screen drum with fine film of water slowly rotates in plenum. Steel baffles on each side of the drum regulate amount of air passing through drum to provide desired amount of humidity. Available in two models, unit operates when blower is on. Installation instruction card doubles as template for cutting hole in plenum.

Gas-Fired Furnaces

LINE OF GAS-fired furnaces in highboy and counter-flow models ranging from 80,000 to 160,000 Btu—*Majestic Co., Inc., Dept. AA, 733 Erie St., Huntington, Ind.* Highboy model can be adapted to lowboy by



adding return air drop at either side. Featured are heavy gage heat exchanger which develops up to 40,000 Btu per section, made of pre-stressed steel designed to eliminate expansion and contraction "ticking"; special track for belt-driven blower assembly

and heavy gage blower pan; and slotted port cast iron burner. Casings are 22 ga; interior surfaces are coated with sound-absorbing, rust and corrosion-resistant material. Lowboys 57 in. high are obtainable with Btu ratings up to 120,000; 60 in. models have 16,000 Btu rating. All models burn natural or LP gas.

Slab Duct Concrete Form

"SAV-CRETE" FORM FOR laying ducts for slab floor perimeter heating systems, designed to insure complete casing of duct to predetermined thickness—*Eward Associates, Dept. AA, 515 Second Ave. W., Seattle 99, Wash.* Spreader spring is wrapped around



duct at intervals as a spacer. "Sav-Crete Ply" is wrapped around springs. Concrete flows freely between springs and around duct but cannot spread into trench. Unit can be used on ducts 4 to 36 in. in diameter, allowing 2 or 3 in. concrete thickness. Specifications for all materials in relation to duct diameter are included.

Protective Sheet Coating

LINE OF REMOVABLE plastic coatings for temporary protection of highly finished sheet metal surfaces during handling, fabrication and shipping—*Guard Coatings Corp., Dept. K-1-AA, 8-05 43rd Ave., Long Island City 1, N.Y.* Liquid plastics, applied to surface by any conventional coating techniques, form tough, abrasion-resistant film when dry. Fast drying solvent solutions and plastic water dispersions are available. Coatings can be removed by peeling, dissolving in vapor degreaser or mild alkali solution or wetting film with water. Product to be used is determined by type of protection, type of surface and fabricating operations to which protected surface is subjected.

Architect: SWANSON ASSOCIATES, INC., Bloomfield Hills, Mich. General Contr.: DARIN & ARMSTRONG, INC., Detroit. Sheet Metal Contr.: J. D. CANDLER ROOFING CO., Detroit. Plumbing, Heating & Ventilating Contr.: PAGE PLUMBING & HEATING CO., River Rouge, Mich. 14,500 lbs. of Revere 16 oz. and 32 oz. Sheet Copper for this installation were supplied by COPPER AND BRASS SALES, INC., Detroit.

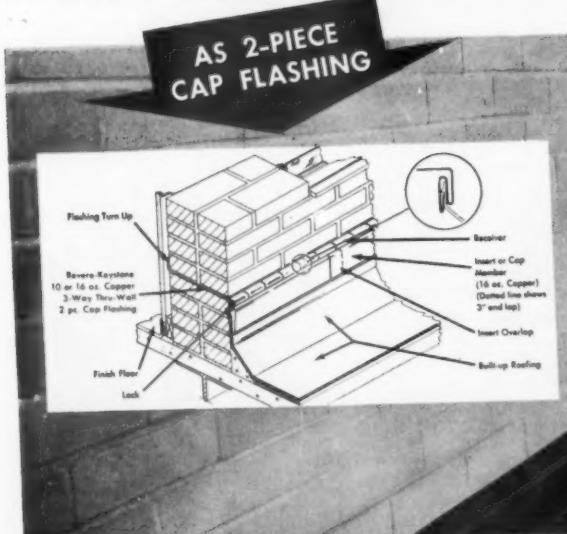


REVERE SHEET COPPER plays dual role in

WOODROW WILSON JUNIOR HIGH SCHOOL Wyandotte, Mich.



AS WARM
AIR DUCTS



AS 2-PIECE
CAP FLASHING

Because of the dampness that was bound to occur over the swimming pool area, the architect specified non-rusting Revere Sheet Copper for the warm air ducts in this \$2,780,606.13 high school. In addition to its enduring qualities sheet copper is readily soldered and formed into any desired shape.

And, for combined thru-wall and cap flashing, the architect specified Revere Keystone* 2-piece Copper Cap Flashing for these reasons:

FREE WALL—It provides the roofer with an unobstructed wall face for the placement of the base flashing. Receiver is laid in during construction of wall, while the insert is snapped in only after all roof and base flashing work is finished.

PERFECT WEATHER-SEAL—Factory-formed angles on the receiver and insert cause latter to hug the base flashing, weather-seal effectively.

NON-LEAKING DAMLOCK—Requires no soldering except for special conditions.

CAN BE DISASSEMBLED—Insert can be removed with a simple tool and used again, with no loss of neatness or snugness, when the built-up base flashing or roofing has to be repaired.

*Patent No. 2,641,203 Other Pats. Pending

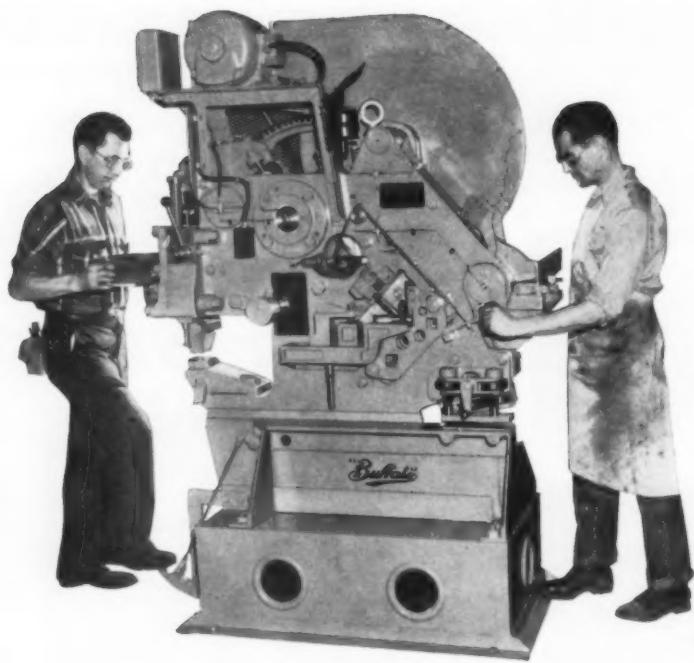
REVERE COPPER AND BRASS INCORPORATED



Founded by Paul Revere in 1801
230 Park Avenue,
New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore,
Md.; Chicago, Clinton and Joliet,
Ill.; Detroit, Mich.; Los Angeles
and Riverside, Calif.; New Bedford,
Mass.; Brooklyn, N. Y.; Newport,
Ark./Ft. Calhoun, Neb. Sales Offices
in Principal Cities, Distributors
Everywhere.

Inset diagram shows detail of Revere-Keystone 2-Piece Cap Flashing with combination receiver and Thru-Wall Flashing. Receiver is furnished in 49" lengths (48" layup), with 1" interlocking tongue which assures proper alignment. Photo shows standard 4" flat copper receiver with $\frac{1}{4}$ " hook dam.



BE COMPETITIVE!

CUT METAL FABRICATING TIME WITH THE "BUFFALO" UNIVERSAL IRON WORKER

To be competitive, every sheet metal contractor knows he must hold fabricating time and costs to a minimum. That's why you'll find the "Buffalo" Universal Iron Worker in more and more sheet metal shops. For a one-machine investment, the UIW speeds up all these operations:

SHEARING • PUNCHING

NOTCHING • COPING • MITERING • SLITTING

Angles, tees, channels, bars, flats — the UIW handles them all with equal ease. This is the only machine that permits both notching and coping operations without changing tools. Investigate the space-saving UIW, which does the work of six machines . . . can perform two operations at once!

Be sure you're competitive — ask your "Buffalo" machine tool dealer for a demonstration of the Universal Iron Worker, or write for Bulletin 360-I.

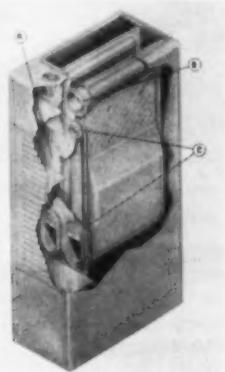


BUFFALO FORGE COMPANY

205 Mortimer Street • Buffalo, N.Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
DRILLING PUNCHING SHEARING BENDING

Redesigned Furnaces

"WESTERN" AND "Atlas" furnace line featuring single point suspension of entire heat exchanger—*Tuck-Aire* Furnace Co., Dept. AA, 2045 Evans



Ave., San Francisco 24. Fastened securely at only one point near the top of the element front, heat exchanger "floats" to accommodate expansion and contraction. Lower portion is free to move vertically in gasketed slots in lower area of element front panel. "Fuel Miser" secondary heat exchanger is said to capture gases forced to recirculate through burner chamber and siphons them off.

Stud Welder

MODEL PS-1 percussive stud welding system for end welding studs to light



gage metals—*K.S.M. Products, Inc.*, Dept. AA, Yale & Woodland Ave., Merchantville 8, N.J. Unit is said to

You Need Both to DO THE JOB RIGHT

General FILTERS and HUMIDIFIERS

► ONE SELLS THE OTHER!

Millions of homeowners rely on a General Fuel Oil Filter for economy and protection against burner failure. Their satisfaction and freedom from worry has attached to the name GENERAL a mark of quality, synonymous with "trouble-free." These same owners are your best prospects for a trouble-free, low-cost General Humidifier. When you sell or service a General Filter "do the job right" — recommend a General Humidifier — service both with a single call!

► FAST, PROFITABLE INSTALLATIONS!

No complicated assembling or fitting — both General Humidifiers and General Filters install with minimum time and labor. Template for cutting humidifier opening in plenum simplifies your job . . . makes every installation profitable!

► NO SERVICE CALL-BACKS!

Here again, you protect your profit. The "800" Humidifier is trouble-free (no float, no tricky pan leveling). Special "Porous Weave" plates resist clogging. General Filters have proved their dependability — on over 3 million installations!

► SURE, YEARLY REPLACEMENTS!

Once each heating season install a set of "Porous Weave" Evaporating Plates (tray holds up to 15) in every humidifier you service, and a genuine General Filter Replacement Cartridge in every filter. You make a handsome extra profit — and your customers are fully protected!

A GENERAL PRODUCT FOR EVERY HEATING NEED



2A-700A
Filter for
Large Homes



2A-300
Filter for
Depth Filtration



2A-17A
Filter for
Heavy Fuel Oils



Model 90
Water Trap for
side or bottom
outlet tank



Model 1A-25A

General
Fuel Oil
Filter

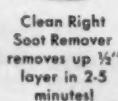
Hi-density Wool Felt Cartridge;
lifetime construction.



Model "800"
GENERAL
Moisture-Matic

featuring float-less Auto-Valve and
"Porous Weave"
Evaporating Plates.

HERE ARE THE FACTS COMPARE! ABOUT FUEL OIL FILTERS									
Comparison of GENERAL FUEL OIL FILTERS with other leading manufacturers									
KEY FEATURES									
ALL IRON AND STEEL CONSTRUCTION	YES	NO	NO	YES	NO	NO	NO	NO	NO
CONDENSATION PROTECTED INSIDE AND OUTSIDE	YES	NO	YES	NO	NO	NO	NO	NO	NO
AIR VENTS ON BOTH PALET AND OUTLET	YES	NO	NO	NO	YES	NO	NO	NO	NO
CHOICE OF INLET AND OUTLET SIZES	YES	NO	NO	YES	NO	NO	NO	NO	NO
CENTER WIRE TORQUE RESISTANCE ENDER TIE THIN	YES	YES	NO	YES	NO	YES	NO	NO	NO
HOLDING CAPACITY LEAKPROOF BUNA-N GASKETS	YES	NO	NO	NO	NO	NO	NO	NO	NO
DEPTH TYPE WOOL FELT ELEMENT	YES	YES	NO	NO	YES	NO	NO	NO	NO
PATENTED LINT REMOVAL	YES	NO	NO	NO	NO	NO	NO	NO	NO
CONDENSATION AND MOISTURE REMOVAL	YES	YES	NO	NO	YES	NO	NO	NO	NO
LARGE CAPACITY TRAP WATER SEALS	YES	YES	NO	NO	YES	YES	NO	NO	NO
TOTAL KEY FEATURES	10	6	1	3	4	2	0	0	0
GENERAL FUEL OIL FILTERS OFFER MORE KEY FEATURES MORE BURNER PROTECTION MORE CUSTOMER SATISFACTION									



Clean Right
Soot Remover
removes up 1/2"
layer in 2-5
minutes!

Compares Generals with other leading
makes of filters. Only General Filters
have all 10 features which influence
sales. Write for handy pocket-size
reproduction.

Contact Your Jobber for Full
Dealer Information — or Write
Direct to Factory.

GENERAL FILTERS, INC.

43800 GRAND RIVER AVENUE • NOVI, MICHIGAN

Canadian General Filters Ltd., 39 Crockford Blvd., Scarborough, Ontario

*Easier and
Faster
to INSTALL*

THE NEW
m·Quay
STAINLESS STEEL FLUE

PACKAGE CHIMNEY

The new McQuay Package Chimney is the finest. It tests better because it is built better—by McQuay, with more than a third of a century of heating experience—and is easier and faster to install. Compare McQuay quality, compare erection time and costs, compare McQuay advantages. Then you'll see why the new McQuay Package Chimney excels in every way. See your jobber or write McQuay, Inc., 1653 Broadway Street N.E., Minneapolis 13, Minnesota.

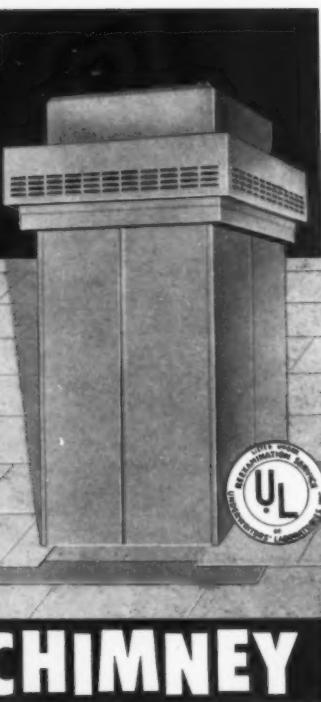
Check these features against those of any other chimney!

- Stainless steel flue • Handles all fuels • Light weight • Strong and durable • Long life • Baked on finish • Quick installation
- Low installation costs • Competitively priced
- Safe—U.L. approved

McQuay
Means Quality

m·Quay
INC.

AIR CONDITIONING • HEATING • REFRIGERATION



Starter Box and Starter Section in one unit for fast erection. Interliner and stainless steel flue supported by exclusive McQuay stainless steel and aluminized steel tension spring spacers. Permits quick drafts and even temperature top to bottom for peak efficiency under steady or intermittent firing.

equipment developments

Continued

operate on stored energy principle which discharges its current and end welds a fastener in 0.006 second. Unit welds diameters up to 3/16 in. Fasteners can be welded to highly polished stainless steel, coated or enameled sheet and other ferrous and non-ferrous metals without distortion, warping, burning through or discoloration. A 2 1/2 lb hand tool holds stud and closes circuit; power unit, which operates from 115 or 230-v, single phase 60 cycle a-c outlet, weighs 144 lb and has wheels. Operator can select proper power setting for his work. Average welding rate of studs is 6 to 8 per minute.

Collar Attaching Unit

ELECTRICALLY-POWERED machine for attaching collars to various types of duct fittings—*Welt-Way Products, Inc.*, Dept. AA, 714 First Ave., N.W.,



Cedar Rapids, Ia. Unit attaches 200 to 300 collars per hour to boots and fittings of various forms ranging from 4 in. to 7 in. in diameter. Unit is powered with 3/4 hp single-phase motor. It operates on 60 lb pressure. Changing from one size collar to another takes approximately 10 minutes.

Power Roof Ventilators

"VANCO UPBLAST" power roof ventilators with flat curb base for low silhouette—*E. Van Noorden Co., Dept. AA, 126 Magazine St., Boston 19*. High velocity units remove heat, smoke and fumes up to 86,000 cfm. Fan action opens dampers. Units fit





Announcing

A COMPLETE NEW LINE OF

SHAFCONAIRE

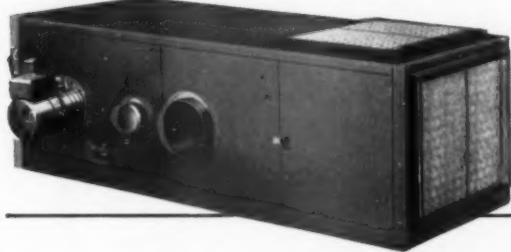
SUSPENDED GAS FIRED FURNACES

priced to give you a competitive advantage in the commercial and industrial heating markets!

Another "First" for Shafconaire! A new line of suspended gas-fired furnaces designed *right* built *right* for commercial-industrial use—and *priced right*, too, to give you profitable, volume sales! For these new Shafconaires actually cost less than any other type of gas heating equipment of equal capacity on the market today. What's more, they're covered by all required approvals for immediate installation.

4 OUTSTANDING FEATURES for Profitable Volume Sales

- **Power Burner**—provides closer control of gases through heat exchanger—gives greater heating efficiency and lower heating costs.
- **Large Capacity**—designed to handle greater volume of warm air at higher velocity—can be easily connected to duct work to provide controlled distribution of heat.
- **Maximum Head Room**—approved for installation two inches from combustible materials, compactly designed to assure greater clearance.
- **Versatility**—quickly, easily adapted in the field for right hand or left hand installation.



AVAILABLE IN 6 BASIC MODELS TO GIVE YOU BROAD MARKET COVERAGE
85,000 — 97,000 — 112,000 — 142,000 — 182,000 — 252,000 BTU Output

In addition to these six basic models, Shafconaire Gas-Fired Furnaces can also be supplied for duct heater applications. All models are furnished complete with power burner, blower, controls and with or without filters as desired.

OverHead Heaters, Inc.

Executive Offices: 1612 Book Building • Detroit 26, Michigan • Woodward 2-4847
Branch Offices: New York • Chicago • Minneapolis

20 years exclusive experience in the design and manufacture of suspended heating equipment



Send Coupon Today for complete specifications and price information on the profitable new line of Shafconaire Suspended Gas-Fired Furnaces. There's no obligation, of course, so act now!

OVERHEAD HEATERS, INC. • 1612 Book Bldg. • Detroit 26, Mich.

Please send complete specifications and price information on your new line of Shafconaire Suspended Gas-Fired Furnaces.

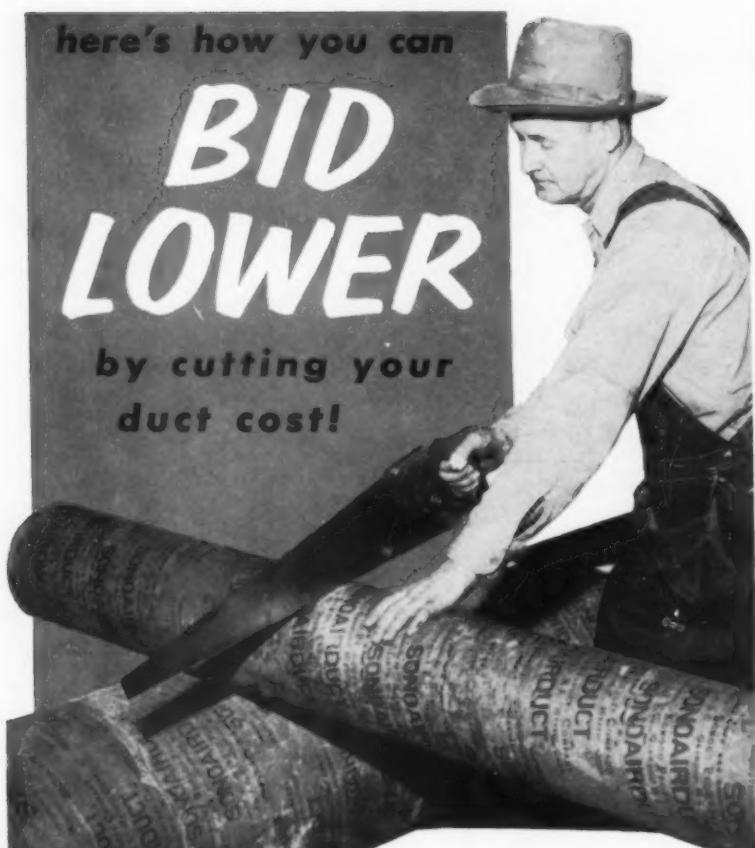
We are **DISTRIBUTORS** **JOBBERS** **CONTRACTORS**

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____



INSTALL
SONOCO
SONOAIRDUCT[®]
FIBRE DUCT

for slab perimeter heating or combination heating and cooling!

Save installation time, labor and money—without lowering construction quality! Economical SONOAIRDUCT handles easy, levels quickly. 23 sizes, 2" to 36" I.D., with the larger diameters ideal for commercial and industrial heating and cooling where duct is encased in concrete. Meets and exceeds F.H.A. criteria and test requirements for this type product. Free installation manual. See our catalog in *Sweets*.

For complete information and prices, write

SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

1652

- HARTSVILLE, S.C.
- LA PUENTE, CALIF.
- MONTCLAIR, N.J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D.F.

equipment developments
Continued

any flat or pitched roof. High velocity discharge keeps out rain or snow when unit is operating; when it is off, sloped dampers close tightly and direct moisture to drainage gutter. Units are in 26 models to exhaust from 1628 to 86,680 cfm.

Tube Cutter

"HIGH-DUTY 274-FA" tube cutter with capacity increased to handle $\frac{1}{8}$ to $1\frac{1}{8}$ in. o.d. tubing of hard or soft temper—*Imperial Brass Mfg. Co.*,



Dept. A.A., 6300 W. Howard St., Chicago 48. Larger cutting wheel is designed to produce faster cutting action and minimize burr in cutting hard temper tubing. Featured are retractable reamer, flare cutoff groove for wasteless cutoff of damaged flares, spare cutting wheel under the reamer and free-wheeling ball thrust bearings for quick size adjustment.

Electric Water Heaters

"REX" ELECTRIC water heaters in two models, round or tabletop styles—*Cleveland Heater Co., Dept. A.A., 2310 Superior Ave., Cleveland 14, O.* Sizes range from 30 to 120 gal; tanks are galvanized or glass lined. Features are quick recovery; thick glass fiber insulation; wraparound heating elements; adjustable thermostats; heavy-duty storage tanks; white enamel finish. Table-high models in 30, 40 and 50 gal sizes are designed for kitchen, utility room or laundry installation.

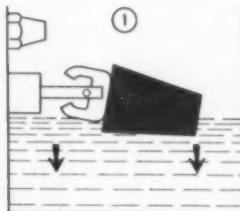
Revolutionary!

KEENEY CLIMATIZER

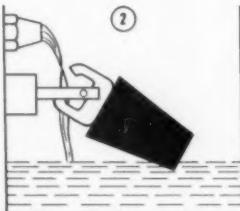
ELECTRIC HUMIDIFIER



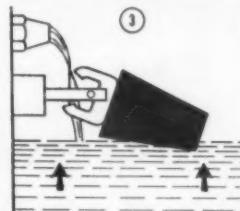
water level controlled by the float switch jet pilots rely on



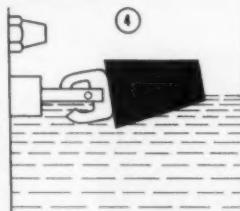
Switch, completely enclosed in float, rides lowering water with imbedded rocker magnet in ready position.



At low water, magnet trips switch. Normally closed, solenoid valve opens, instantly lets water in.



Switch rides rising water. Float made of nitrogen-exploDED rubber, has cellular construction, cannot sink.



At desired water level, magnet again trips switch. Solenoid valve closes, instantly shuts water off.

POSITIVE HUMIDIFICATION!

Exclusive, built-in heating element produces a vapor which rises directly into air stream. *No evaporation plates!*

MAGIC COVER!

Prevents crud accumulation. Regardless of water conditions, keeps microscopic particles in *colloidal suspension* until exhausted in the vapor escaping through the holes.

SMALL, COMPACT, EASY TO INSTALL

Model 250—wired to operate when blower is ON.

Model 251—wired with electric plug for continuous operation.

NOTHING TO JAM, CLOG OR FAIL

WRITE FOR
COMPLETE
INFORMATION!



THE KEENEY MANUFACTURING CO.

NEWINGTON, CONNECTICUT

Follow the leader — KEENEY

SOUTHERN SCREW'S NEW BULK PACK SAVES YOUR SPACE ...it's designed for you!



If space is a problem in your materials movement and storage, Southern Screw's new bulk packing system offers MULTIPLE SPACE—AND TIME-SAVING ADVANTAGES AT NO EXTRA COST TO YOU, regardless of the size of your operation.

Southern Screw's completely redesigned bulk packing meets strict industrial standards for faster, more efficient materials movement. Included in Southern's re-designed system are:

- (1) A completely new carton—9" x 9" x 6½"—telescope-type, wire-bound 275# test heavy duty corrugated board construction, for easier, higher stacking by one man or by power equipment.
- (2) Adoption of, as standard, a disposable 30" x 30" two-way entry pallet, carrying 4 layers of 9 bulk cartons each, with protective steel strapping. Movement to production line or storage can be in full pallet quantities or broken into smaller units for manual handling.

Based on the new carton and palletized system, standard packing quantities for each item have been established. Write for new chart, BP-1, which defines these standard packing quantities. For your copy, address Southern Screw Company, Box 1360, Statesville, N. C.

Wood Screws • Tapping Screws
Wood Drive Screws
Machine Screws and Nuts

Warehouses: New York • Chicago • Dallas • Los Angeles

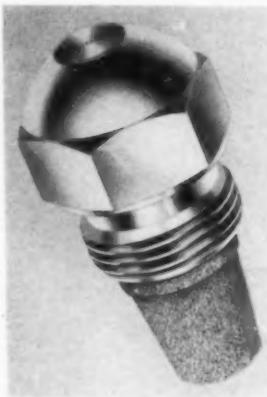


equipment developments

Continued

Nozzle Filter

ONE-PIECE porous bronze nozzle filter designed for long wear and increased filtering area—Wm. Steinen Mfg. Co., Dept. AA, 43 Bruen St., Newark,



N.J. Firm seal is said to eliminate passage of dirt or impurities, allowing maximum firing efficiency of nozzle. Cone shaped wall permits easier flow. Small size is designed to simplify handling and replacement.

Furnace Vacuum Cleaner

MODEL H.D. heavy-duty drum vacuum cleaner which attaches to any standard open-head 55 gal drum to give full pickup capacity of 48 gal



dry or 40 gal wet material from furnace—Black & Decker Mfg. Co., Dept. AA, Pennsylvania Ave., Towson 4, Md. Unit is powered by 1½ hp motor which is sealed against dirt

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WEIRKOTE®—THE RIGHT CHOICE BY EVERY MEASURE

No matter what the specifications of your heating or air-conditioning duct work, Weirkote will meet them as only a quality zinc-coated steel can. No other metal can match it.

Take, for instance, the strength and rigidity of Weirkote. It's a natural for spanning large areas without bending or buckling and with a minimum use of supporting brackets. Consider, too, its fire protection. Its higher melting point makes it provably safer than competing metals. Since ducts sometimes carry volatile matter with a low flash point, this protection can be vital.

Important, too, is Weirkote's economy. Made by the continuous process which integrates zinc and steel, Weirkote can be worked to the very limits of the steel itself without flaking or peeling. Permanent corrosion resistance is provided in every seam and surface. Which, of course, all adds up to longer, maintenance-free life for Weirkote ducts. And its ease of installation cuts cost still further.

After a Weirkote duct installation is in and operating, your clients will find still another reason to be glad you specified Weirkote—it's quiet. Noisy creaks and cracks of expansion and contraction are minimized. With all these advantages plus economy, you just can't go wrong with Weirkote.

Free Weirkote Booklet

Send for the new booklet on Weirkote today. Write Weirton Steel Company, Dept. J, Weirton, W. Va.



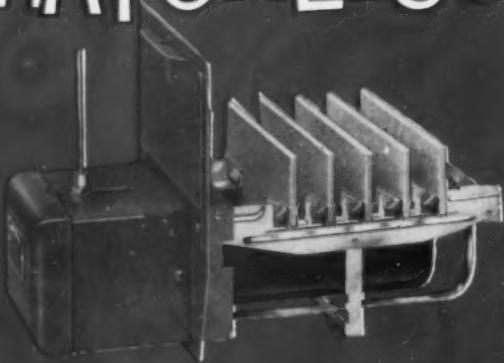
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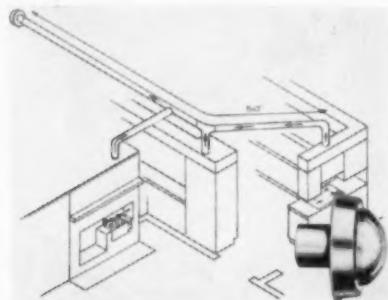
equipment developments

(Continued)

and water. Motor drives a two stage turbine type centrifugal fan. Variety of attachments and steel dolly are also available.

Kitchen Ventilator

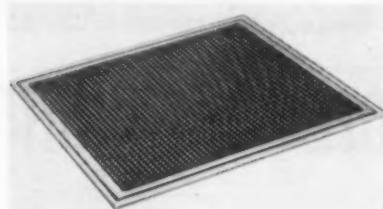
"KITCHEN-AIRE" KA-170 exhaust fan which produces 1100 cfm free air and exhausts up to three separate intakes—*Stewart Industries, Inc., Dept. AA, 320 E. St.*



Joseph St., Indianapolis 2. Impeller pulls, rather than pushes, air outside the house. Self-contained unit has wall cap, damper, motor and impeller in one housing which mounts outside the house on wall or roof, according to the manufacturer.

Perforated Air Diffusers

"PERFAIR" PERFORATED air diffusers with matching return or exhaust units—*Air Devices, Inc., Dept. AA, 185 Madison Ave., New York 16.* Units have interchangeable cores in a variety of air pattern arrangements.



ments for one, two three or four way throw. Built-in air controllers are designed for positive adjustment of air deflection after unit is installed. Perforated face plate blends with acoustical ceilings; matching return or exhaust units are in same design. Separate mounting frames are included for quick installation of supply or return units.

Short Stack Gas Regulators

MODELS RV-30A AND RV-41A gas regulators with reduced stack dimensions and pipe turn radii for gas-

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There's no need to let a sudden shortage of stainless steel upset your work schedules. Just call your nearby Armco Distributor. Chances are that he has the stainless steel you need in stock . . . ready for immediate delivery from his Steel Service Center.

If your requirements for grade, size, or shape are out

of the ordinary, let your Armco Distributor know a few days in advance. He can usually obtain it without delay from Armco's extensive mill stocks.

If you don't know the name of the Armco Distributor nearest you, just check this list. Armco Steel Corporation, 2268 Curtis Street, Middletown, Ohio.

(A)—Sheet, strip & plate

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ARIZONA
PHOENIX
Ducommun Metals & Supply Co. (B)

CALIFORNIA
BERKELEY
Ducommun Metals & Supply Co. (B)

EMERYVILLE
Electric Steel Foundry Co. (AB)

LOS ANGELES
Ducommun Metals & Supply Co. (B)
Electric Steel Foundry Co. (AB)
Earle M. Jorgensen Co. (AB)

NATIONAL CITY
Ducommun Metals & Supply Co. (B)

OAKLAND
Earle M. Jorgensen Co. (AB)

COLORADO
DENVER
C. A. Crosta, Inc. (A)
Electric Steel Foundry Co. (AB)
Metal Goods Corp. (AB)

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HARTFORD
The American Steel &
Aluminum Corp. (AB)
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Corp. of Massachusetts (AB)
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Steels, Inc. (B)

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Congdon & Carpenter Co. (AB)

MICHIGAN
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KANSAS CITY
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Metal Goods Corp. (AB)

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says Emil Dahlin



"TI-CO sheets are soft enough to take intricate forming quickly and easily . . . they hammer flat and stay flat. Yet, they're strong enough to withstand roughest treatment in handling and installation."

—Emil Dahlin, Shop Foreman
Northern Metal & Roofing Co.
Green Bay, Wisconsin



Ask your distributor for the TI-CO Brand . . . the galvanized sheet tailor-made for sheet metal work.

INLAND STEEL COMPANY

30 W. Monroe St., Chicago 3, Illinois

equipment developments

(Continued)

fired equipment with restricted mounting areas—*Maxitrol Co., Dept. AA, 12200 Beech Rd., Detroit 39.* Model RV-30A has compressed width dimension of 2 15/16 in and overall height of 2 7/16 in. Pipe turn radius is 1 1/2 in. It is used for main burner and pilot load applications with capacities of 120 to 95,000 Btu/h or main burner load applications with capacities from 10,000 to 100,000 Btu/h of 800 Btu per cu ft, 0.7 specific gravity gas. Model RV-41A is 2 15/16 in. wide, 3 1/4 in. high with pipe turn radius of 2 9/16 in. It is used for main burner and pilot load applications with capacities from 15,200 to 174,000 Btu/h of 800 Btu per cu ft, 0.7 specific gravity gas.

Foil-Covered Rigid Insulation

"FIBERGLAS" rigid insulation with thick embossed aluminum foil vapor barrier—*Owens-Corning Fiberglas Corp., Dept. AA, National Bank Bldg., Toledo 1, O.* Duct materials are in rectangular and round shapes. Rectangular ducts are flat, pre-scored insulation boards ready for folding into duct sections. Aluminum foil,



bonded to exterior with flame-resistant adhesive, serves as vapor barrier and tough exterior finish. Fibrous glass ducts absorb noise and permit high velocity heating and cooling. Material has low heat transfer coefficient: distributed air remains at nearly constant temperature in flow. Tools required for installation are knife, clips, tape and stapler.

Bending, Forming Dies

"CHICAGO ALLOY-FORM" dies for bending and forming various alloy sheets and plates—*Dreis & Krump Mfg. Co., Dept. AA, 7400 S. Loomis Blvd., Chicago 36.* Dies, designed to fit any make of press brake, are made of high quality carbon steel. Forming edges have a superfine finish to avoid marring material surfaces. Wear surfaces of die are induction hardened to prolong life without reworking, the company reports.

Motors with Self-Cleaning Switches

LINE OF ELECTRIC motors with redesigned switches said to eliminate faulting due to contamination—*A. O.*

equipment developments

(Continued)

Smith Corp., Electric Motor Div., Dept. AA, 531 N. 4th St., Tipp City, O. "Scissor action" design is said to make switches self-cleaning and end buildup of carbon on points. Protection capsule totally encases starting switch, capacitor, actuator, thermostat and terminal panel for protection against foreign materials, the manufacturer states.

Sight Glass for Liquid Lines

"SUPER DRY-EYE" redesigned sight glass and moisture indicator for refrigerant liquid lines in air conditioning equipment—*Refrigeration Products Div., Ansul Chemical Co., Dept. AA, Marinette, Wis.* Pad and filter protect indicating elements from constant flow of refrigerant. Minute particles of circulating solids are



collected by filter. Moisture indicating elements have been moved across bottom third of the sight glass. Improved fluorinated hydrocarbon refrigerant 22 indicating element is incorporated. Indicator is made of woven, non-fibrous material to resist adherence of solids and staining by oil breakdown products. Elements for both refrigerants have rapid color changing properties. Vividness of coloring has been heightened.

Refrigerant Line Connector

"FLEX-HOSE" TYPE F flexible metal connector for refrigerant lines—*Korfund Co., Inc., Dept. AA, 48-014 32nd Pl., Long Island City 1, N.Y.* Unit is made from



corrugated, seamless bronze tubing which is protected and reinforced by braid design covering to provide

"Inland TI-CO® ends flaking headaches too!"

says Ted Klinger



"Since we started using Inland TI-CO we don't have to worry about the zinc coating flaking off when we're working the steel. This means less make-overs and better looking, longer lasting jobs."



—Ted C. Klinger, President
Associated Manufacturing Corp.
Kalamazoo, Michigan

Ask your distributor for the TI-CO Brand . . . the galvanized sheet tailor-made for sheet metal work.

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Zeph-Air is the gas furnace with the cast-iron heart. The entire heating element is unconditionally guaranteed — for LIFE!

A limited number of exclusive franchises protect our dealers — and we assist them with many kinds of dealer helps. Write today to see if a franchise is open for you. We'll give you the details you need and want — no obligation, of course. We'll also be pleased to furnish complete information on our air conditioning units for use with our heating equipment.

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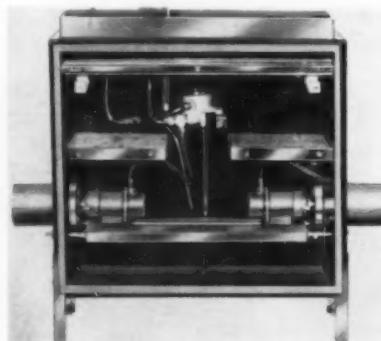
equipment developments

(Continued)

high burst strength. Connector has sweat-fitting copper tube ends for attachment to rigid piping. Hose is said to withstand working pressures up to 150 psi. Ten sizes which accommodate equipment fittings from $\frac{1}{4}$ to $2\frac{1}{8}$ in. o.d. have single high tensile braid; four sizes from $2\frac{5}{8}$ to $4\frac{1}{8}$ in. o.d. have high tensile double braid. Standard hose lengths range from $2\frac{1}{2}$ to 32 in. Hose assembly is pressure tested, cleaned, degreased and packed in sealed polyethylene bag.

Air Mixing Boxes

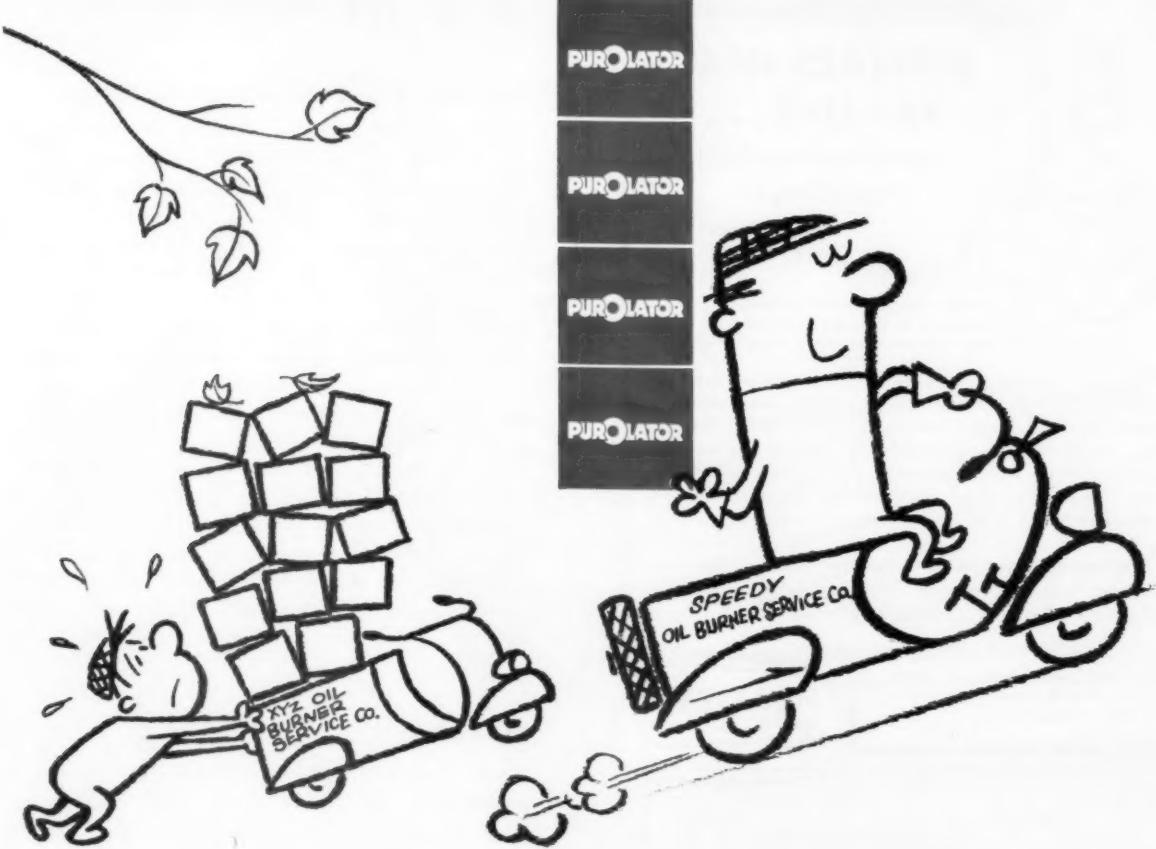
"THERMOTANK" high velocity perimeter and ceiling air mixing boxes with "Con-Vol" (constant volume) device designed to assure precision control of air volume and temperature without use of linkage, regardless of inlet static pressure variations—*Air Devices, Inc., Dept. AA, 185 Madison Ave., New York 16*. Flow regulators and pneumatic motors are mounted



on sliding bases; control valve is mounted directly to the motor shaft. On full cooling, room thermostat holds hot valve closed, flow regulator positions cold valve for desired design volume. On heating cycle, thermostat positions hot valve for correct discharge air temperature, flow regulator positions cold valve for constant volume. Under extreme demands, cold valve closes completely and flow regulator controls hot valve position to maintain constant volume.

Aluminum Polish

"MET-ALL" metal polish said to restore aluminum to a bright finish after exposure to dirt, oxidation and water stains—*Anton Co., Dept. AA, 15 Bridge St., New York 4, N.Y.* Polish contains no abrasive, the manufacturer reports. Product serves as effective cleaner and contains enough silicones and waxes to insure lasting finish. Occasional buffing is said to further extend brightness of aluminum. Packed in 2 lb cans, compound is also suitable for polishing copper, brass, and chrome.



Carry only 4 Purolator filter refills for 98% of all filter replacements

And now is the time to protect every oil burner with a Purolator filter . . . protect yourself from emergency calls this winter

The fact that 4 Purolator Oil Burner filter refills take care of 98% of your oil burner installations is exactly half the story. There's also this: *now* is the time to check the filter on every burner you service. Why? Because dirt is being drawn towards the nozzle as furnaces start up these cool nights—and dirt-clogged nozzles account for most of your burner failures. You

stop all dirt particles as small as .0005 of an inch with a Purolator filter. It actually has 5 times the dirt retention and flow capacity of the biggest competitive units. Give them that kind of protection now (it lasts at least a year without servicing) and this winter you'll be free from many of the usual annoying emergency calls.

One more thing: a simple cross re-

ference chart has been worked out by Purolator that shows you which refills will fit all popular makes of filters. It's yours for the asking—and the coupon below makes it easy to ask, right now.

TO: PUROLATOR PRODUCTS, INC.
RAHWAY, N. J.

Please send me your oil burner filter cross reference chart.

Name _____

Title _____

Company _____

Street _____

City _____ Zone _____ State _____

Filtration For Every Known Fluid

PUROLATOR
PRODUCTS, INC.

RAHWAY, NEW JERSEY AND TORONTO, ONTARIO, CANADA

AMERICAN ARTISAN, NOVEMBER 1958



- Visible and/or audible alarm
- Signals 6 to 8 hours in advance of danger
- Uses current only when signalling

Placed at a window so as to be seen by a neighbor or police, HEAT EYE is a constant, reliable protection. Thermostatically actuated, it will signal failure of any heating system to maintain a safe temperature. It is an ideal guard in the homes of people away on winter vacations, buildings under construction and in many commercial establishments. Pre-set at 50° F. it will signal trouble hours before damage by freezing can occur.

IDEAL FOR FUEL AND HEATING CONTRACTORS . . . eliminates periodic checks of unoccupied buildings . . . inspires customer confidence . . . may be rented, sold or loaned.

PRICES: \$7.00 per unit; lots of 10, \$6.50 per unit. All orders C.O.D. Satisfaction guaranteed or money refunded.

Literature upon request.



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A PREFABRICATED FLEXIBLE DUCT CONNECTION

Simply pull out desired length from dispenser-type carton. [It pulls out ready to use.] Roll into round duct or form into square duct and join. Saves 70% time over old methods. **DOUBLE-SAFE-LOCKED**

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new literature . . .

Oil Burner Installation and Service

"DOMESTIC OIL BURNERS and Oil Heat Installation Service," by Lee Auslander, is a classroom textbook as well as a reference manual for oil burner servicemen. The author, a combustion engineer and heating instructor, points out that most of the material was assembled during his 22 years as heating mechanic, service manager, engineer and classroom instructor. The book explains the function of the burner and its allied equipment and describes the various types of heating systems in use today. Information is included on high and low pressure gun type burners; rotary and vaporizing burners; combustion chambers; chimneys and drafts; controls and wiring; thermostats; and zone control. Divided into two sections, the book contains 246 pages of text and 156 pages of illustrations and tables. Text pages open to the right, illustrations to the left, thus permitting text and related illustrations to be studied simultaneously—Rinehart & Co., Inc., Dept. AA, 232 Madison Ave., New York, N. Y.

Insulation

"How To Be More Comfortable and Live for Less," prepared for distribution among home owners, explains the values of thick insulation. The booklet points out that insulation pays off in hard cash—that it will pay back 8 to 15 percent of its cost per year in winter fuel savings alone. Tables show savings in operating costs of both heating and air conditioning systems in 46 representative cities in all parts of the U. S.—National Mineral Wool Association, Dept. AA, 2906 Americas Bldg., Rockefeller Center, New York 20.

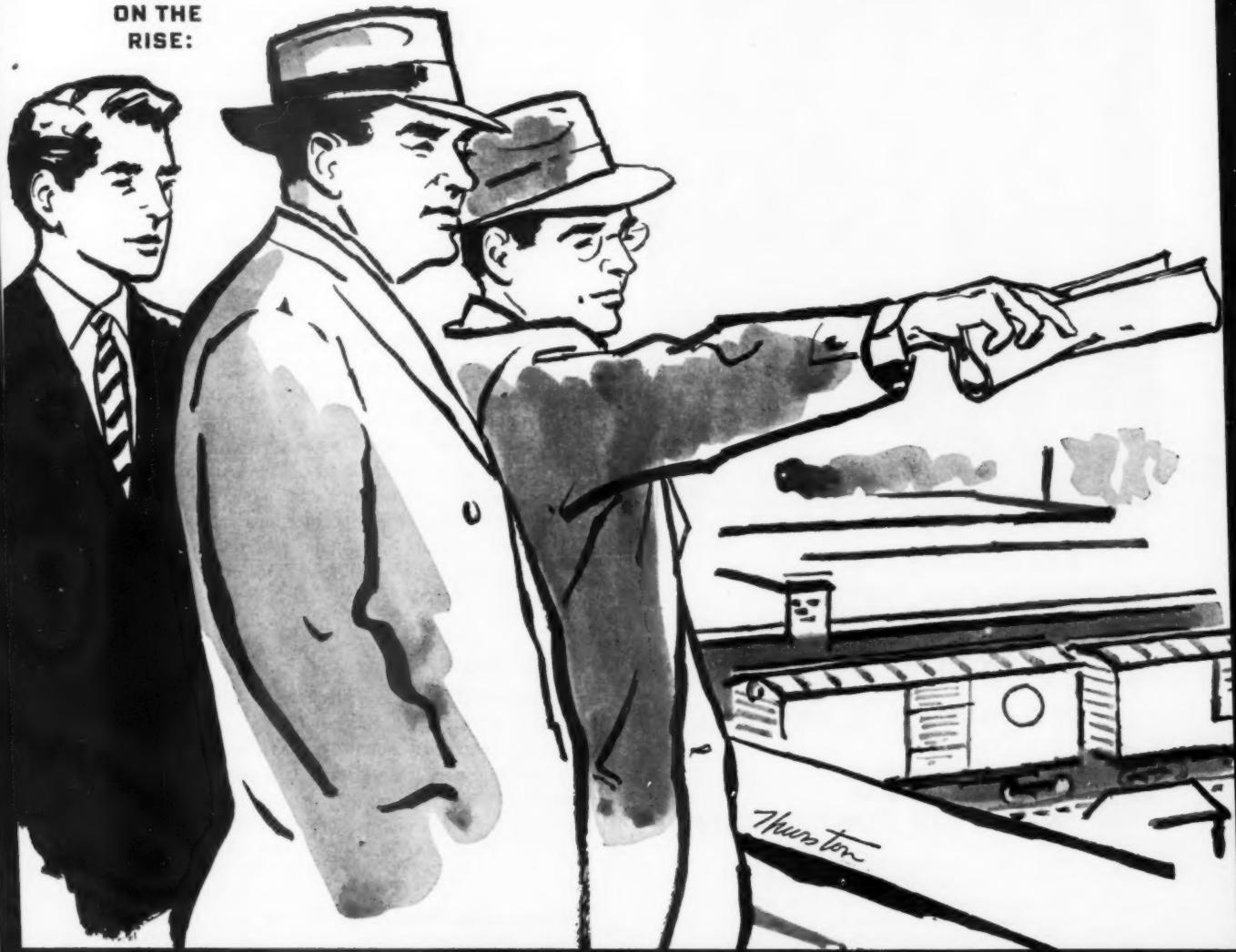
Air Cooled Condensers

ENGINEERING MANUAL (24 pages) covers selection, installation, operation and maintenance of "Zephyron" air cooled condensers. Tables, capacity charts and drawings of typical installations are included—Larkin Coils, Inc., Dept. AA, 519 Memorial Dr., S. E., Atlanta, Ga.

Welding Supplies

WELDING SUPPLIES are illustrated and described in form ADC 848C (52 pages). Included is information on ferrous and non-ferrous rods for gas welding, fluxes for welding and brazing, aluminum welding fluxes, and "Aircosil" brazing alloys. Accessory items described include protective clothing, goggles, electrode holders, sparklighters, cable, hose, weld cleaning tools, etc. Air Reduction Sales Co., Div. of Air Reduction Co., Inc., Dept. AA, 150 E. 42nd St., New York 17.

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TO MEN
ON THE
RISE:**



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One of the stepping stones to success is the ability to get the *inside word* on what's going on in your business. There's no better source for that *word* than the business-paper serving your particular field.

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for information he must have. Carefully, because he's reading for profit, not for pleasure. Thoroughly, because he wants to know, *what's in it for me?* And, for these reasons, he reads the advertising with the same intense concentration he devotes to the editorial pages.

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"I'm looking for
GOOD Distributors
and Dealers
to handle profit packed

KALAMAZOO WARM AIR CONDITIONERS"

"I'm Clyde Whitcomb, president of Kalamazoo Furnace & Appliance Manufacturing Company. "The fine distributors and dealers who represent us deserve much credit for our steady growth and continuing success in the field of warm air heating. Choice territories and exclusive dealerships are still available, however. "For those of you who are looking for the best buy, your best buy by far is Kalamazoo. We take pride in the all around fine performance of our units.

"Interested? Call, write, or wire today. Let's discuss the situation."



new literature

(Continued)

Gas Unit Heaters

GAS-FIRED UNIT HEATERS for factories, showrooms, garages, warehouses and other commercial applications are described in catalog No. 400-1. Ten models are available in capacities ranging from 25,000 to 250,000 Btu/h. Illustrations include product and application photographs as well as a cutaway view showing details of construction. Tables give dimensional and performance data—John J. Nesbitt, Inc., Dept. AA, Philadelphia 36.

Special Purpose Blowers

ILLUSTRATED BROCHURE (bulletin 5412, 16 pages) presents data on special purpose blowers including duplex and cabinet blowers, ducted fans, double-inlet fans, and twin fan units. Sizes range from a vaneaxial fan with a wheel diameter less than 4 in. to a large volume centrifugal design with a wheel diameter greater than 16 inches. Specifications include capacity range, operating speed, construction features and typical applications—American-Standard, American Blower Div., Dept. AA, Detroit 32.

Direct Fired Heaters

DATA ON FIVE MODELS of direct fired heaters is presented in a four page, illustrated circular. Heaters are available in various mountings, are designed to meet the requirements of a wide range of applications, the company states. Equipment uses light oil, heavy oil, gas, gas and light oil, or gas and heavy oil—Arkos Mfg. Co., Dept. AA, 7310 Woodward Ave., Detroit 2.

Renewable Media Air Filter

"FAR-AIR ROLL-KLEEN" disposable media air filter for use in plants and office buildings or any installation requiring frequent filter changes is described in bulletin B 1400-2A (eight pages). Media is changed by winding the used portion onto a spool and drawing clean media into the face of the filter from a supply roll. All media movement is governed by automatic controls. Capacity tables, installation instructions, and ordering information are included—Farr Co., Dept. AA, P. O. Box 45187, Airport Station, Los Angeles 45.

Mild Steel Electrodes

CHANGES IN THE SPECIFICATION for mild steel electrodes are contained in the booklet "Specification for Mild Steel Arc Welding Electrodes." Changes include the following: 1) addition of three new iron powder electrodes, two of which are low hydrogen types; 2) new E70 mild steel classification containing six electrode types; 3) listing of certain electrodes in the E70

new literature

(Continued)

as well as the E60 series; 4) addition of two tables, one showing the mechanical properties to be expected in the as-welded condition and one giving a comparison of current ranges. Copies are priced at 50 cents—*American Welding Society, Technical Department AA, 33 W. 39th St., New York 18.*

Humidity Control for Air Conditioning

BULLETIN 1720 "Target for Comfort" describes a humidity control system for room air conditioners. According to the company, the system enables a room air conditioner to provide dehumidification without producing uncomfortably low temperatures. System operation is based on an adaptation of a thermostatic control and an automatic reversing valve developed by the company for automatic heat pump systems—*Ranco Inc., Dept. AA, 601 W. Fifth Ave., Columbus 1, O.*

Solenoid Valves

ILLUSTRATED DATA SHEET covers "L" series solenoid valves designed to give a full flow of air, water, oil and other media through a $\frac{1}{2}$ in. orifice with either $\frac{3}{8}$ or $\frac{1}{2}$ in. pipe ports. Valves are said to handle pressures from 5 to 150 psi, with temperatures from -40 F to 180 F—*Skinner Electric Valve Div., The Skinner Chuck Co., Dept. AA, 95 Edgewood Ave., New Britain, Conn.*

Asbestos-Cement Duct

DIAGRAMS AND PICTURES showing installation of "Transite" air duct for perimeter heating and air conditioning systems are presented in a 12 page brochure. On-the-job photos show the three main systems — loop, radial and lateral — as they are being installed. A guide for installing the duct, based on FHA and NWAHACA recommendations, is also included. Photographs show how duct can be cut on the job and how fittings can be made with pre-cut segments—*Johns-Manville, Dept. AA, 22 E. 40th St., New York 16.*

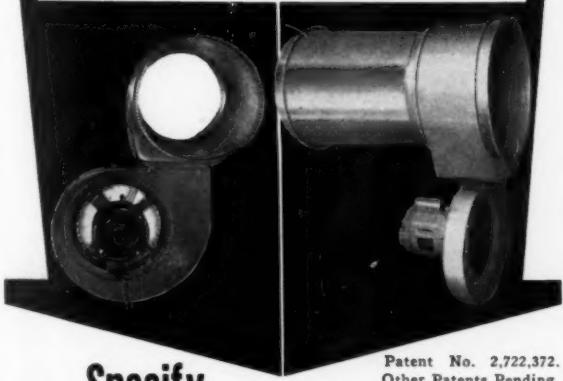
Paint for Galvanized Surfaces

PRIMER PAINT for rusted, weathered or new galvanized steel is described in Red Lead Technical Letter No. 13. Information regarding surface preparation is included—*Lead Industries Association, Dept. AA, 60 E. 42nd St., New York 17.*

Heavy Duty Fans

CATALOG 1361 titled "Heavy Duty Mechanical Draft Fans" describes centrifugal fans designed for handling abrasive gases at elevated temperatures. Application,

FOR LOW COST HEATING PLANT POWER-DRAFT AND INDUSTRIAL EXHAUSTING



Patent No. 2,722,372.
Other Patents Pending.

...Specify

Quickdraft

★ NO MOTORS, FANS OR BEARINGS
IN EXHAUST LINE ★ NEEDS NO STACKS
★ ACID RESISTING FINISHES ★ STATIC
PRESSURE UP TO 60 INCHES

FOR HEATING PLANTS AND INCINERATORS, Quickdraft provides constant draft for efficient and economical combustion. It eliminates pulsating or chattering, puffing, smoking and sooting. Costly, tall and unsightly stacks are unnecessary.

FOR INDUSTRY, Quickdraft now offers from $\frac{1}{4}$ -inch to 60-inches static pressure for exhausting corrosive gases, abrasives and paint spray . . . moving fine bulk materials and wastes.

FOR MOVING AIR . . . in or out of building through ducts . . . Quickdraft is outstanding.

IMPORTANT NOTICE

For withstanding corrosive gases, all Quickdraft units are available in standard acid resisting vitreous enamel, No. 316 Stainless Steel, rigid plastics (P.V.C.) and with plastic and Fiberglas coatings.

Write for QUICKDRAFT ENGINEERING DATA on your application . . . today.

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NATIONAL LOCK standard and special-purpose FASTENERS

You can depend on National Lock Fastener service to keep your production lines humming. Standard Fasteners are available in a complete selection of uniform quality. What's more, National Lock offers a full line of special-purpose screws, bolts, nuts and washers, too . . . every size and type to meet your specific requirements. Our fastener engineers will work with you. Order from the dependable production and engineering resources of the National Lock Company.

Catches • Latches

Crating Bolts

Handles • Pulls • Hinges
Knobs • Sems • "Kems"



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ILLINOIS TOOL WORKS

NATIONAL LOCK COMPANY

ROCKFORD, ILLINOIS

• • FASTENER DIVISION

new literature

(Continued)

performance, and physical data are given as well as a list of optional accessories—*Westinghouse Sturtevant Div., Dept. T-315, AA, 200 Readville St., Hyde Park, Boston 36.*

High Velocity Air Valve

CATALOG No. F-8752 covers "Uni-Flo" high velocity air valve, composed of gang operated, neoprene vane sections. The company states that the valve, designed for use in a variety of applications, can be used in single duct systems to control velocities and to balance the system, or in double duct applications to mix hot and cold air and to control velocities. Included is engineering data as well as dimensional, descriptive and application information—*Barber-Colman Co., Dept. 766-AA, 1606 Rock St., Rockford, Ill.*

Fill Alarms for Oil Tanks

"KING" FILL ALARM with union connection for installations on tanks where possibility of breaking lines indicates need for a union fitting is described and illustrated in Form No. 807-5-58. Also described is the company's compression lock fill alarm. Both are designed for installation on either new or existing tanks. Alarms feature whistle signals which operate while tank is filling and stop when tank is filled to safe capacity level—*Oil Equipment Mfg. Corp., Dept. AA, 169 Derby Ave., New Haven, Conn.*

Insulation Adhesives

FOUR PAGE ILLUSTRATED CATALOG describes insulation adhesives and sealers. Properties, uses and application methods are listed in chart form—*Adhesives, Coatings and Sealers Div., Minnesota Mining and Mfg. Co., Dept. AA, 423 Piquette Ave., Detroit 2.*

Welding Aluminum

TRAINING MANUAL (144 pages) presents information on welding aluminum by the tungsten-inert-gas and metal-inert-gas welding processes. Introductory chapters contain information on aluminum alloys and their characteristics, the preparation of aluminum for welding, and types of equipment and supplies needed. Sections 2 and 3 present procedures to follow in setting up equipment and establishing an arc in flat position, single and multi-pass horizontal and vertical welding. Information is also given on making butt, fillet and overhead welds. Schematic drawings show the work setup for joining parts prior to welding. Send requests on company letterhead—*Kaiser Aluminum & Chemical Sales, Inc., Technical Publications Dept., Dept. AA, 919 N. Michigan Ave., Chicago 11.*



PROVEN PERFORMANCE • EASY TO INSTALL

NEW HUDEE AIRE

(Distributors
and Dealers
now being
selected!)

AUTOMATIC HUMIDITY CONTROL SYSTEM

Here at last is a truly *practical* automatic humidifier for forced warm air heating systems. Market proven for 3 years . . . hundreds of installations under all types of conditions. It's easy to install in the furnace plenum . . . just make a few simple adjustments and you have another satisfied customer. The cost is low (\$49.75 suggested retail) . . . and so is maintenance (no fins to replace!). Every home with forced warm air is a live prospect. Hudee Aire boosts comfort, promotes health, cuts fuel bills.

WIRE COLLECT or write today for spec sheet, prices and details of distribution and profitable promotion plan.



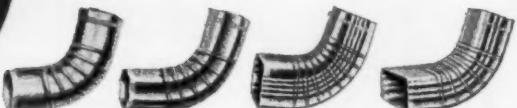
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Cincinnati Elbows really get around

For the right angle on the right connector, specify Cincinnati Elbows. Precision shaped and tapered on fully automatic machinery for positive uniformity, Cincinnati Elbows slip together effortlessly for a sure, tight fit. Once installed, they look better and last longer, because they're hot-dipped *after* formation for a smooth, rust-resistant finish. So, next time, don't take chances. Order easy-fitting Cincinnati Elbows. Available in all sizes, angles and gauges in copper, aluminum, stainless or galvanized steel. Ask your jobber today.



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The Engineered
GAS VENT
SYSTEM

Dura-Vent Tops are engineered for maximum efficiency, smart appearance, and ease of installation. They are scientifically designed to help—rather than hinder—draft action. Couplings are precision tooled for safe, sure, double-locked installations. Dura-Vent tops them all in appearance, too—complements even the most expensive homes.

Two, big, modern plants and eight, completely stocked warehousing points assure you of prompt, reliable service to any area. Dura-Vent pipe and fittings are available in all sizes—designed and engineered for any architectural specification. Listed by Underwriters Laboratories.

Write, wire or phone us today for detailed specifications and prices.



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we hear that . . .



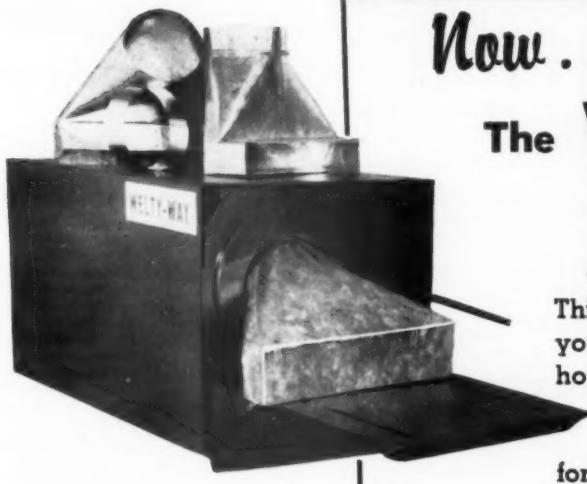
F. W. Legler

► **F. W. LEGLER**, a director and vice president of The Waterbury Co., has been appointed the firm's general manager. With the company since 1919, Mr. Legler at the time of his recent promotion was eastern division manager in charge of sales, a position he has held for the last 10 years. During the time he spent in the East, he was a member of the staff of the University of Connecticut, where he taught heating and air conditioning. He is a past president of the Minneapolis Heating and Air Conditioning Association and also of the Sheet Metal and Warm Air Heating Contractors Association of Minnesota.

► **F. H. SPEAKER & SON** and Jess L. Korschot & Son, heating and air conditioning dealer-contractors of Lafayette, Ind., have combined their operations. Offices and showrooms will be maintained at 414 N. Earl Ave. T. B. Speaker, who will serve the organization as an engineer, pointed out that by consolidating their operations, the firms expect to be able to provide better service than either company could offer individually. He said that Robert Blair will be responsible for service to regular customers of F. H. Speaker & Son, and that J. C. Burkhouse will serve the organization as an installation man. Products handled include Bryant, Janitrol, Lennox and York heating and air conditioning equipment.

► **OVERHEAD HEATERS, INC.** has been conducting a series of "field installation" clinics designed to acquaint dealer-contractors, architects, engineers and others with the advantages of using horizontal, ceiling suspended heating equipment in supermarkets, gasoline service stations, factories, warehouses, etc. Each of the day-long clinics starts in the morning with a field trip to an actual installation. Here various methods and techniques for installing horizontal furnaces are pointed out and the influence of the building's structural conditions on equipment selection and installation is explained. A demonstration of how to balance the job for maximum efficiency is followed by a question and answer session. The afternoon is devoted to a discussion of all factors involved in installing, servicing and maintaining suspended heating equipment.

► **O. A. SUTTON CORP.** has suspended operations according to a recent statement by company officials. It was pointed out, however, that the firm, which is now liquidating inventories to meet its bank debts, expects to remain in business.



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literature today!

Now . . . Featuring The **WELTY-WAY** **Collar Attaching Machine** **newest time-saving device available**

This handy machine will enable you to cut your working time almost in half. In only one hour the new WELTY-WAY Collar Attaching Machine will attach from 200 to 300 collars to boots and fittings of various forms ranging from 4" to 7" collars. It takes approximately just 10 minutes to change dies from one size collar to another. This machine is powered with a $\frac{3}{4}$ HP single Phase motor and requires 60 lbs. air pressure to operate.

WELTY-WAY PRODUCTS INC. 714 FIRST AVENUE, N.W.
CEDAR RAPIDS, IOWA

Distributors for WELTY-WAY Collar Attaching and Gutter Machines

New from our **BERGER** division
two gas-fired winter air conditioners that give you

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FOR PROFITS



UTILAIRE

When floor space is at a premium, the Utilaire is the right choice for installations requiring discharge of conditioned air from top of unit. Streamlined three-tone jacket. Capacities from 75,000 to 250,000 BTU/Hr input.

Exclusive Burnham-Berger Furnace features, design-engineered for extra efficiency, make them inexpensive but not "cheap." Time saved in easy installation and maintenance represents more money in your pocket, too.

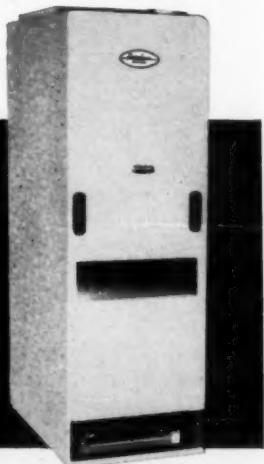
1. V-Flame Burner directs flames toward sides of heat exchanger, gives uniform heat, requires minimum maintenance. Burner stays lit.
2. Floating "Heat-Wringer" Exchanger squeezes every degree of heat potential from fuel, eliminates expansion noises.
3. "Cradled-in-Felt" Blower and Motor assembly operation is easily accessible, can be quickly converted for cooling.
4. Slim-line design for space economy.

Try them — you'll find them Easy to Sell, Easy to Install, Easy to Maintain and you make a good profit on each sale.

A.G.A. Approved • Heat Exchangers guaranteed for a period of years.

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BELLE VERNON, PA.

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INVERSAIRE

Primarily for use in the basementless home. Very compact. Air is discharged at bottom of unit for distribution in slab or crawl space. Smart two-tone jacket. Capacities from 75,000 to 200,000 BTU/Hr input.

P-K hardened MASONRY NAILS

for dependable fastenings to
BRICK • MORTAR • CONCRETE • CINDER BLOCKS



signs
flashings
gutters
pipe clamps
brackets
conduit
insulation
base channels
fixtures
outlet boxes
cornices

P-K MASONRY NAILS can be hammered into soft types of masonry as easily as ordinary nails into wood. Harder materials like brick or concrete require only a starting hole. You save, too with P-K MASONRY NAILS. No expansion bolts, lead anchors, plugs or costly gadgets. Specially hardened ribs embed the nail into the masonry—prevent back-out, grip tightly against shock or vibration.

Ask your Distributor for Free Samples or write to

PARKER-KALON® fasteners

PARKER-KALON DIVISION, General American Transportation Corporation
Peekay Drive, Clifton, New Jersey

we hear that

(Continued)

► ROBERTSHAW-FULTON CONTROLS Co. plans to build a \$2.5 million plant for the production of thermostatic controls near Youngwood, Pa. According to T. T. Arden, president, the new plant will replace present manufacturing facilities operated at Youngwood and at Scottdale by the firm's Robertshaw Thermostat Div. Principal reasons for building the new plant, Mr. Arden said, are to provide room for expansion of the facilities and to incorporate more efficient manufacturing techniques.

► ROBERT K. MILLER has been named president of the Holly-General Div. of The Siegler Corp. Prior to joining the Siegler firm, Mr. Miller was manager of General Electric Co.'s Home Heating and Cooling Dept.

► THIS YEAR'S RECIPIENTS of National-U.S. Radiator Corp.'s scholarship awards are John C. Court, New Castle, Pa., and Gary W. Henger, Johnstown, Pa. Under its scholarship program, the company pays college tuition, buys books and pays living expenses to selected high school graduates who want to become engineers but have no scholarship help and cannot otherwise afford a college education.

The firm recently dedicated its new million dollar Engineering Center at Johnstown. The center, containing more than 40,000 sq ft of space, houses the company's general engineering and research staff and general manufacturing executives. Extensive facilities are included for the testing of residential air conditioning units and other products.

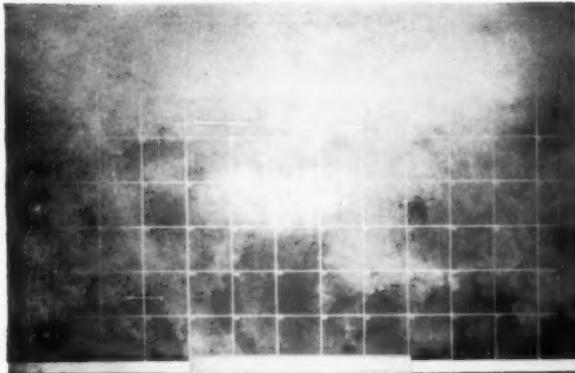
► I. J. HIBBARD has retired from The Peck, Stow & Wilcox Co. and will reside at his home in Jefferson, Wis. Mr. Hibbard sold "Pexto" sheet metal machinery and hand tools throughout the Midwest for over 27 years.

► MODERN MATERIALS Co. has changed its name to Modern Lighters, Inc. The firm will continue in the engineering, design and manufacture of lighter tubes for gas fired equipment. Headquarters are located at 46330 W. Seven Mile Rd., Northville, Mich.

► LARRY HICKOK, president of Ohio Furnace Co., has acquired ownership of the Buckeye Furnace Fitting Co. Mr. Hickok stated that the Buckeye firm's principal products will continue to be pipe and fittings for heating and air conditioning equipment.

► DONALD J. WALKER has been appointed marketing manager for the Metals Div. of Limbach Co., Pittsburgh sheet metal contractor. In his new position, Mr. Walker will handle all marketing activities for both the Pittsburgh and Columbus, O. branches of the Metals Div. He has been with the company since 1952.

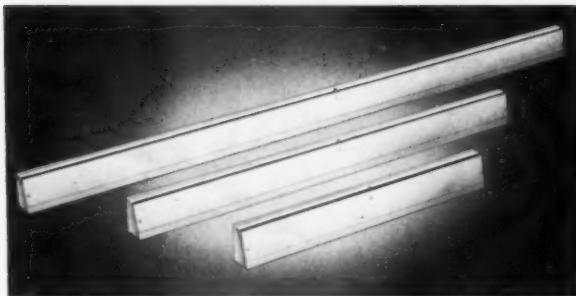
FAN-AIR® BASEBOARD DIFFUSERS



BEST by TEST

Recommended For Heating and Cooling

THREE SIZES: 3', 5', 8'



More Profitable to Sell

You sell with convincing confidence when you know that you sell the very best!

Ask your jobber to show you the results of extensive smoke tests which compare numerous other makes with FAN-AIR. See for yourself that FAN-AIR is proven BEST in performance in all three sizes: 3', 5', 8'.

The unobtrusiveness of FAN-AIR baseboard diffusers . . . the perfection with which they blend or harmonize with the decor of every room . . . is the "something different, something better" which you can offer as your distinctive feature in heating and cooling installations.

Engineered to satisfy the standards of good heating and cooling. Made of 20 gauge steel. Easily installed in new or old homes, with built-in balancing dampers and instantly adjustable boot openings.

Sell FAN-AIR—it's profitable.

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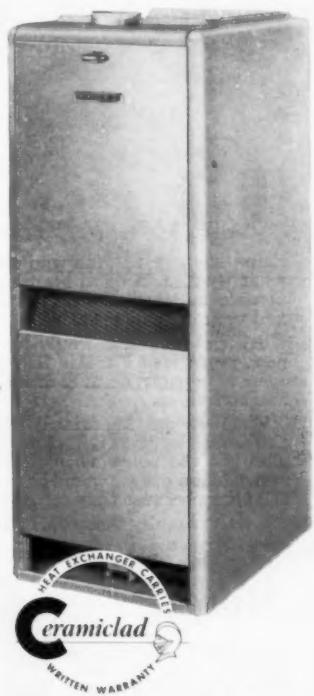
America's gas heating specialists!

Central Gas Heating
for all homes,
all locations!

You stay a jump ahead of competition when you let it be known that you represent famous Temco central heating. Building contractors and home buyers alike respect the Temco name. They honor it for premium construction . . . value it for excellent performance . . . demand it for versatility of line that adapts easily, perfectly, to every location, budget and building requirement!

*Temco Counter-
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- * Temco Hi-Boy Series
- * Temco Lo-Boy Series
- * Temco Horizontal Forced-Air Furnace
- * Temco Perim-Air-Pac



Ceramiclad® heat exchangers—your biggest sales exclusive! Only Temco heat exchangers are finished in Ceramiclad, the exclusive porcelain enamel finish similar to that used for jet aircraft combustion chambers. Ceramiclad withstands far greater temperatures than any furnace will ever reach—and is impervious to condensation.

There's a Temco air conditioning unit to use in combination with every Temco furnace!

*Trade Mark Registration Pending

Write now for complete information:

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NASHVILLE 9, TENNESSEE

"Gas Heating Specialists for the Nation"



"THE COMPLETE LINE OF GAS HEATING EQUIPMENT"

ROOM HEATERS • FLOOR FURNACES • WALL HEATERS • UNIT HEATERS
WARM AIR FURNACES • AIR CONDITIONING • GAS WATER HEATERS

The Porcupine Who Became Very Sharp!



Once upon a time ...

there was a porcupine who often appeared somewhat needed. He had been buying outmoded disposable media filters that were expensive to use and very difficult to install.

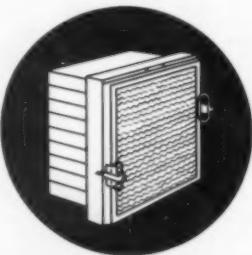
At first he felt it would be pointless to try the new, preformed Far-Air HP Filter which had become so popular, because of its efficiency, economy, and convenience.

Then one day his friendly Far-Air man slipped a folded HP Filter right under his door. Mr. Porcupine got the point when he popped it open and realized how easy it would be to install. He specified HP filters because they solved his problem.

Now he's really sharp ... he's sticking with them.

Moral:

Compare before you specify. See the new Far-Air HP Filter. Take quill in hand and fill out the coupon below.



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FARR COMPANY
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I see the point! Send me the full story on HP Filters. Bulletin 1300-2.

NAME _____

TITLE _____

COMPANY _____

STREET _____

ADDRESS _____

CITY & STATE _____

we hear that

(Continued)

► CONSTRUCTION has been started on a combination office and warehouse building in Louisville, Ky., for Reynolds Aluminum Supply Co., a subsidiary of Reynolds Metals Co. The new building will be an aluminum covered structure containing 50,000 sq ft of warehouse space and 3500 sq ft of office space. Facilities will include power shears and slitters to cut metal to customer requirements.

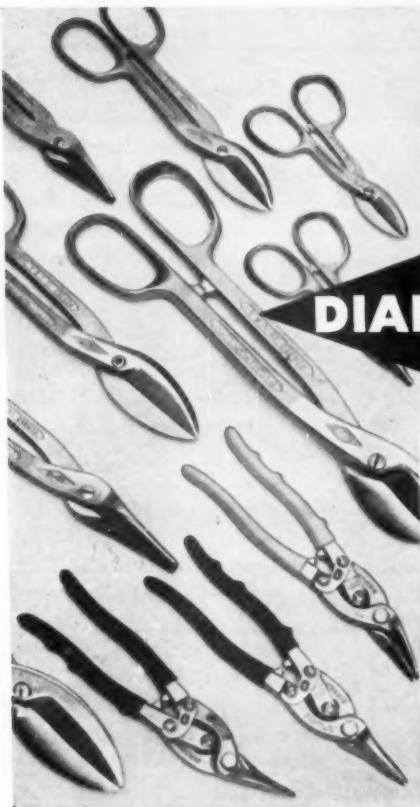
► BARRY BLOWER CO.'S EXPANSION PROGRAM has already resulted in a 100 percent increase in plant and other facilities this year, according to Ben Barry, president of the company. Barry Blower was recently elected a member of the Air Moving and Conditioning Association, Inc.

► ROBERT W. HUNDLEY, general sales manager of Wm. Steinlen Mfg. Co., was recently appointed national chairman of the domestic education committee of Oil-Heat Institute of America. Mr. Hundley has been an active member of the committee for the past two years. His initial directive to committee members was to formulate an educational program tailored specifically to meet the needs of installers and servicemen in the automatic oil heating industry.

► J. H. GOTWALS has been named senior vice president and general manager of the Heater and Tank Div. of John Wood Co. Mr. Gotwals has been a vice president of the division since 1955, and has been responsible for its operations in Chicago and Conshohocken, Pa.

► K S M PRODUCTS, INC. has opened a new warehouse and sales office at 656 Folsom St., San Francisco, Calif. The San Francisco office will supervise and service stud welding accounts for the central and northern California areas as well as activities in Washington and Oregon. John T. Rayner, former district sales engineer for Philadelphia, has been appointed regional sales manager for the Pacific area. He will be assisted by F. G. Kern, district sales engineer for San Francisco and northern California. The company has also opened a new office in Los Angeles to handle sales and service in the southern California area.

► THE LIMA REGISTER CO. can now supply special sizes of air conditioning grilles within 10 days after orders are received at the factory, according to C. B. Armour, the firm's sales manager. Models requiring special assembly and finishing are fabricated the day the orders are received. Grilles are painted every Thursday and shipped every Friday. Use of standardized components and modern production facilities makes it possible to maintain this rapid service, Mr. Armour says.



DIAMOND

**DIAMONDS CUT CIRCLES
AROUND OTHER SNIPS**

Try Diamalloy snips and see how much easier they cut. Edges are induction hardened and stay sharp longer. Your hardware and industrial distributor stocks Diamond Tools—Ask for them by name.

"There is nothing finer than a Diamond."

DIAMOND TOOL and Horseshoe Co.

DULUTH · MINNESOTA

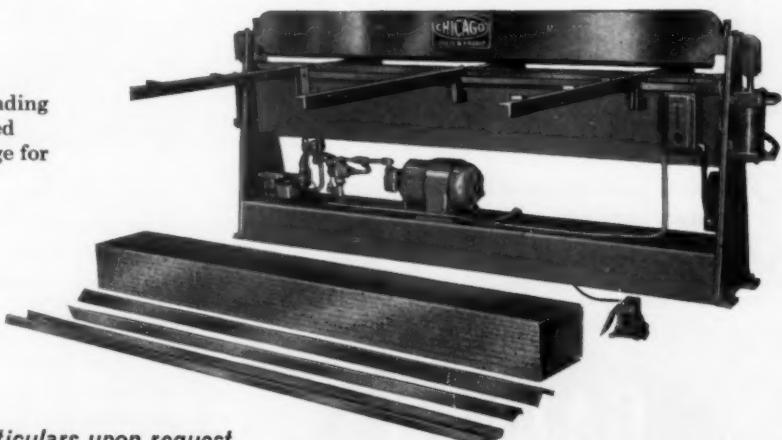
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TORONTO · CANADA

Production Bending for duct sections and long, light-gauge work

CHICAGO® SPEED-BENDER

- 8 feet of 24-gauge or 5 feet of 20-gauge galvanized steel
- Adjustable front gauges; disappearing pin gauges for bending from notches; and spring-loaded gauge pins to make $\frac{1}{4}$ -inch edge for Pittsburgh lock
- Hydraulic operation
- Foot-switch control
- Two-position foot switch can be supplied for 90° bends and for shallow bends as in cross-braking



Full particulars upon request

8626



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Press Brakes • Press Brake Dies • Straight-Side-Type Presses • Bending Brakes • Special Metal-Forming Machines

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I SAY SIR!

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the facts
about . . .**

GALVAN ELBOWS



✓ Check the
GALVAN
trademark for . . .



Hot dipped galvanized after forming to insure Long Life and eliminates seam leaks.



Easy to install because they *F-I-T.

*Fast Installation Time

GALVAN
MANUFACTURING COMPANY
NEW ALBANY, INDIANA

► SHELDON R. GARDNER has joined Sondik & Co., Inc., Hartford, Conn. wholesaler, as executive vice president. He was previously with the Herrick Co., where he served as Hartford branch manager, vice president, and general sales manager. Among the products handled by the Sondik company are Waterman-Waterbury furnaces Marco skylights, Pexto machines and tools, Air Control registers and grilles, and Van Packer chimneys.

► GEORGE R. THOMAS has been appointed sales manager for Hinkle Supply Co., Birmingham, Ala. Territory served by the Hinkle firm includes Alabama and parts of Florida, Mississippi and Georgia.

► TWO GRAND RAPIDS WHOLESALERS, Michigan Automatic Heating Equipment Co. and Harris Supply Co., have joined forces and are now operating as Heating and Cooling Wholesalers. The new firm has headquarters located at 1576 S. Division, Grand Rapids. Branch warehouses are located at 9-11 Mills St., Kalamazoo; 501 W. Tobias, Flint; and 511 E. Grand River, Lansing. Major lines handled are Waterman-Waterbury furnaces and air conditioning equipment, International furnaces and air conditioning units, Tecumseh condensing units, Dunham-Bush evaporator coils and cooling towers, and Reznor unit heaters. Refrigerants, copper tubing, fittings and controls will also be handled. Robert H. Swart is president of the company; Ila H. Unseld, vice president in charge of branch operations; Clarence W. Harris, vice president in charge of purchasing; and Francis J. DePauw, vice president in charge of sales.

► SOUTHWEST SUPPLY CO., 510 8th Ave., San Diego, Calif., has been named a wholesale distributor of Mathes central system air conditioning equipment in San Diego county.

► MICHAEL R. CONRAN has been appointed manager of A. Y. McDonald Mfg. Co.'s Bloomington, Ill., branch. Mr. Conran went to Bloomington from Kansas City, Mo., where he had been manager of the central industrial division. He replaces Ed Thompson, who has taken charge of the company's branches at Joplin and Springfield, Mo.

► STEWART SUPPLY CO., Greenville, S. C., has added Rheem furnaces and "Rheemaire" residential air conditioners to its line of heating and air conditioning products.

► FEDERATED DISTRIBUTING CORP. has been appointed to handle distribution of Gibson room air conditioners and dehumidifiers in Indianapolis and sur-

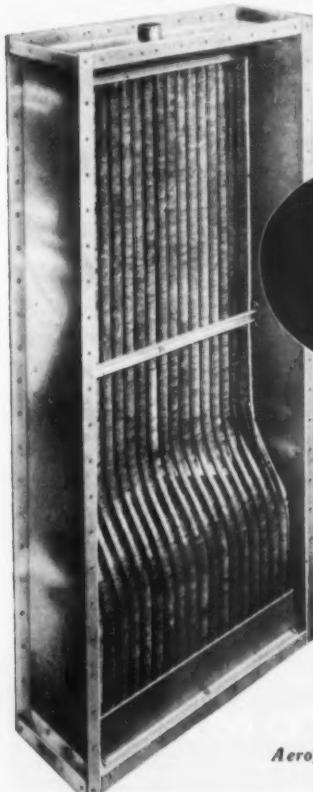
**In the New York market
 . . . where price is
 an important factor . . .
 and rigid building
codes exist . . .
**Empire Ventilators
 outsell all others.****



Sold thru
 leading
 wholesalers.
 See your
 jobber.

Empire Ventilation Equipt. Co.

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 Long Island City 6, N. Y.



**Heating? Cooling?
 Air Conditioning? Process?**

**Here's How to
 Get the **RIGHT** Answer to your
 HEAT-EXCHANGE PROBLEMS**

The right ratio of surfaces—the right materials—the right velocities—the right proportion between coil area and depth . . . there are dozens of factors that affect the efficiency, maintenance and service life of heat-exchange coils.

For best performance in your own application, the practical approach is to take full advantage of the unequalled engineering, research and design skill—the unequalled manufacturing and testing facilities—which Aerofin offers you.

To get the *right* answer—ask the Aerofin man.

AEROFIN CORPORATION

101 Greenway Ave., Syracuse 3, N. Y.

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

wholesaler doings

(Continued)

rounding counties. The Indianapolis firm has headquarters at 1414 S. West St. Principals are Evan T. Curry, president, and M. G. Biesecker, vice president and general manager.

► THERMAL SUPPLY INC., Houston wholesaler, has acquired the assets of United Supply of San Antonio and of its branches in Austin, Corpus Christi, Harlingen, McAllen and Victoria. In addition to the above, Thermal Supply has subsidiaries located in Beaumont and Galveston, Tex. and in Monroe and Shreveport, La. The corporate officers of the parent company are Elmer K. Peterson, president; Winston C. Peterson, executive vice president; Alex Trevino, vice president; William F. Hauber, merchandising vice president; and Tom E. Gossett, secretary-treasurer. Alex Trevino is president of the United group and Elmer K. Peterson is president of the Thermal group. The combined companies, with 11 warehouse locations, will cover an area which includes the state of Louisiana (exclusive of the Baton Rouge and New Orleans portions) and the eastern, southern and southwestern part of Texas.

► BARTON LYNCH has been named president of the Sid Harvey Westchester Corp., Mt. Vernon, N. Y. Mr. Lynch was previously vice president of Sid Harvey of

Md. Inc., and before that was manager of the company's Baltimore branch. Sid Harvey, former president of the Mt. Vernon operation, becomes chairman of the board, a position that he holds in 13 other Sid Harvey companies.

The Harvey organization has recently opened a new operation located on Oriskany Blvd. Whitesboro, which is just west of Utica. Hugh Jones, formerly a sales engineer for Sid Harvey's in Albany, has been appointed manager of the new facility.

► PETE RHODES SUPPLY Co., Springfield, Mo., has been appointed a distributor of Rheem warm air furnaces and "Rheemaire" central air conditioning equipment in Springfield and the surrounding area. William S. Rhodes is president of the Rhodes company.

► MCADAM PLUMBING & HEATING CO., Montgomery, Ala. wholesaler with offices at 668 S. McDonough St., has been named to represent John Zink Furnace Co. and National Thermatic Corp. in the Montgomery area. The McAdam firm will handle the sale of air cooled air conditioning equipment.

► AIR CONDITIONING & HEAT PUMP Distributors, Inc., 2775 La Cadena Dr., Riverside, Calif., will handle distribution of Matthes room air conditioners and central air conditioning equipment in Riverside and San Bernardino counties.

PROOF that all Baseboard Diffusers are not alike



the
NEW
P-68

New **P-68** with
28 square inches of free area

Length 18"
Stackhead Sizes:
2 1/4 x 12
2 1/4 x 14

Visioneered to answer today's huge demand for a shorter, more efficient baseboard diffuser, P-68 with 28 square inches of free air space is taking the lead!

P-68 offers considerable savings in time and labor costs because the installation is so simple . . . yet in operation it compares to other diffusers UP TO THREE TIMES ITS SIZE. The P-68 delivers a perfect diffusion pattern . . . a soft, gentle fan of air . . . ideal for heating or cooling. Highly attractive design and smooth modern lines blend with any baseboard style in new or remodeled homes.

Write for the complete A & A catalog showing our full line of registers, diffusers and grilles for every type of heating and air conditioning installation.



The A & A REGISTER COMPANY

8327 CLINTON ROAD • CLEVELAND 9, OHIO • ATLANTIC 1-6166

Cut ANY Shape in Metal... with a BEVERLY THROATLESS SHEAR!

• Capacities to 3/16" in mild steel

• Make clean, knurl-free cuts in any metal to capacity

• High Carbon High-Chrome Blades

• Built to last a lifetime



Here's What a Beverly Can Do!

Cuts made in
18 ga. metal
with Model B-1



Model B-3
with Ball
Bearing
Hold Down

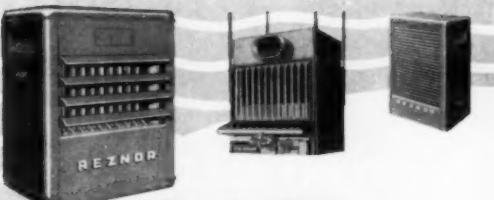
Beverly Shears are the most versatile metal shearing tools you can use. Unique shoulder design permits any cut . . . rack and pinion gives great power with little effort. Alloy steel body for maximum rigidity and strength. Made in 4 models.

Write for illustrated circular — or see your Beverly Distributor.

Beverly SHEAR MFG. CO.

3020 W. 111th Street

Chicago 43, Ill.



reliability

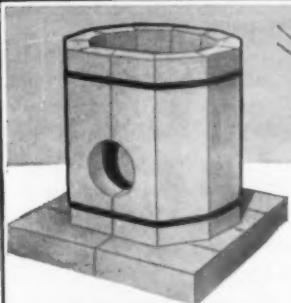
If it's true that one good job sells another, then Reznor gas heating equipment should be a real business-builder. Reznor makes the finest unit heaters you can install . . . tops in quality and consistently ahead in engineering. Reliable, efficient Reznor installations make friends for you . . . and word gets around. Reznor reliability also means that you don't have to worry about service call-backs eating away your profits.

RELIABILITY — just one of the many reasons why Reznor dealers make more sales . . . and more money. Ask your Reznor distributor for the complete story.



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WORLD'S LARGEST SELLING DIRECT FIRED
UNIT HEATERS

Reznor Manufacturing Company, 6 Union Street, Mercer, Pa.



GEM
REFRACTORIES

COMBUSTION CHAMBERS

ENGINEERED TO
YOUR REQUIREMENTS

. . . GEM engineers are at your service for special designs . . . developing new units or redesigning to reduce assembly costs. Send us your prints.

GEM Combustion Chambers are engineered refractories built for performance and designed for easy, fast installation . . . highest combustion efficiency for high or low-pressure burners.



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Engineers for
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Shapes.

GEM
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ORNAMENTAL LEADER STRAPS



3", 4", 5" Sizes 2", 3", 4" Sizes

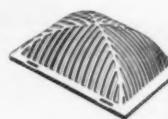
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Ornamental Leader
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SOLD THROUGH
JOBBERS ONLY

"FITRITE" ROOF STRAINERS

Bronze and Aluminum

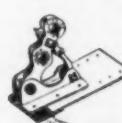


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3"-8" round.
Also 3" x 4",
4" x 5" square



3 types
6", 8", 10",
12" square

ADJUSTABLE PIPE SNOW GUARDS



"FITRITE"
3 pipes,
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For all
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of steep
roofs



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SMITH'S

180° UNIVERSAL BRAKE

Smith's 180° Universal Brake is the answer to the need for one low cost tool that can handle a wide variety of bending and forming jobs with speed and accuracy. Designed to permit selective bending of portions of a workpiece without restriction, the Universal Brake's application and use is literally unlimited. It will handle 18 gauge mild steel 26" wide to 7 gauge 1 1/4" wide, at any angle, up to 180° in one operation. It has adjustable angle stops and back gauges to assure precise duplication of work pieces, making it a very valuable production tool. Write for illustrated circular and more details.

U.S. Patent No. 2,651,349

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WAUKEGAN ILLINOIS

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SAVES
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**...on FURNACE PIPE
DUCTS and FITTINGS**

You actually save time, labor and money with MONCRIEF'S pipe and fittings, for this duct work is uniform in size, quality and workmanship. MONCRIEF'S simplified system of ordering, cuts figuring time, assures faster delivery and greater profits. Write for Catalogue or order from your wholesaler today.

Moncrief FURNACE COMPANY

P. O. BOX 1673

ATLANTA, GEORGIA

appointments . . .



Paul M. Augenstein



Joseph B. Ogden



F. J. Laughna

► PAUL M. AUGENSTEIN as president of Chrysler Corp.'s Airtemp Div., succeeding C. E. Buchholzer, who recently resigned. Mr. Augenstein for the past 23 years has been with General Electric Co., serving for the last three years as general manager of room air conditioner activities. Joseph B. Ogden, formerly general manager of Whirlpool Corp.'s air conditioning division, has been appointed vice president in charge of sales. He will be responsible for expanding the Airtemp dealer-contractor and distributor organization, and will also work on the development of new merchandising programs. Frederick J. Laughna has been named director of branch operations for the division. Mr. Laughna joined Chrysler in 1933, has been with the Airtemp Div. since 1940. He has served in various sales capacities and at the time of his recent promotion was director of regional operations.

► WILLIAM F. STEINER as sales manager of the Payne Co. Mr. Steiner joined the company as a factory sales engineer in the northern California area and later became assistant sales manager, a position he held until his recent promotion. Don Driver has been appointed a sales engineering representative and will cover the southern California territory.

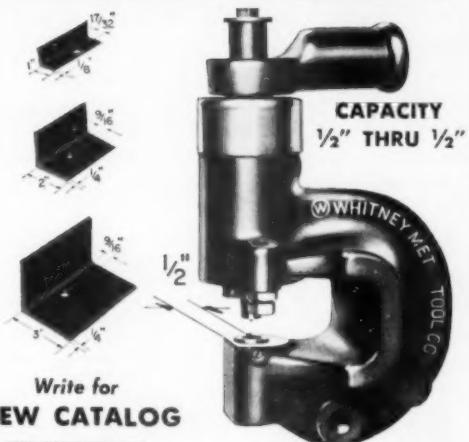
► RICHARD F. MAHURON as general manager of the Lau Blower Co.'s western division plant in Irwindale, Calif. Mr. Mahuron has been works manager of the Irwindale plant since 1955.

► JOHN T. TIGHE as appliance sales manager for the Delco Appliance Div., General Motors Corp. Mr. Tighe succeeds William J. Wagner, who has been appointed general sales manager of the Delco Products Div.

► HARDIE W. BECK as general manager of the Pittsburgh plant of Joseph T. Ryerson & Son, Inc., succeeding Arthur L. Petersen who is retiring after 45 years of service. Mr. Beck joined the company at Pittsburgh in 1945, and has since served as manager of the inside sales department, sales representative, and sales manager. Mr. Petersen began his career with the company in 1913. He served in the sales department at the Chicago and Detroit plants, later moved to St. Louis where

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WHITNEY-JENSEN No. CTW-20
BALL BEARING PUNCH



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WHITNEY METAL TOOL COMPANY
702 Forbes St., Rockford, Ill. Since 1910

30% Savings on Labor Cost

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ST. CLAIR Insulation Adhesive specially formulated for bonding insulation material to metal, supersedes pins and clips, wires, screws, and caps. Provides easier, quicker handling. For bonding immediately or up to 45 minutes later.

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E-Z-ONS

Cost Less
Offer MORE!

E-Z-ON "Snap-Tite" Design No. 29



Special tail piece has retractable snap end bearing . . . eliminates need to bend damper or spring duct to insert damper.

You pay less and get more features with speedy E-Z-ON damper regulators, because they're design engineered to do a better job . . . quicker.

Here's Proof:

- Lower Price . . . Means Lower Cost to You
- Double Prongs Mean Double-Grip . . . No chance of swiveling
- Washer is Permanently Attached . . . No loose washer to drop or fall in pipe
- Modern "Swept" Wing Nut is Eye-appealing . . . Adds new beauty to installations
- Balanced Construction . . . Prevents possible binding of damper in duct.

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all leading jobbers stock E-Z-ON
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Improved 5 WAYS
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THE LINE WITH
14 GREAT MODELS

Pre-assembled to permit
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- Stronger mounting of front-end thermostat.
- Complete adjustability of drip valve.
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- New positive thermostat control.
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THEY ALL ADD UP TO:

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Fits any straight
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furnace.

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CEDAR FALLS, IOWA

**THE LESLIE
"SERIES 50"
SLANT ROOF TYPE
VENT**

Combines all these features:

- ★ EASIER INSTALLATION—4" wide flange . . . no "legs" or "posts" to get in the way.
- ★ WEATHERPROOF—wide flange around top of stack, plus parallel baffle in rear.
- ★ MORE FREE AREA—as certified by Metal Ventilator Institute.
- ★ BETTER APPEARANCE—streamlined, one-piece top, and roof-hugging design.
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- ★ STURDIER CONSTRUCTION—full .025" aluminum, 26-gauge galvanized steel, screen securely attached.

Available in galvanized steel or aluminum, the "50 Series" Roof Vent is YOUR best answer to the demand for a vent that installs without trouble, that looks and performs well, and provides top quality at the right price.



ASSURES TIGHTEST POSSIBLE SOLDERED SEAMS

. . . without any acids

. . . without any cleaning

. . . use 50-50 or 95-5 or other

soft solders with equal assurance



With LA-CO Flux you can be sure of sound, leak-free soldered jobs every time. Its modern formulation clears the way for a perfect alloying of solder and metal . . . and stretches your solder dollars too.

LA-CO Flux makes physical cleaning and sanding old-fashioned. All the muscle is built right in, yet it costs no more. It works right through metal oxides, oil and grease — definitely fluxes right through the chemical treatment coating on galvanized metals.

Yet, with all this self-cleaning power, LA-CO Flux is completely free of acids. It will not stain metals or injure workers . . . is safe for use with foodstuffs, oxygen lines, etc.

LA-CO Flux (Regular) is used for soft soldering of copper, lead, galvanized iron, tin, zinc and other common metals. See for Yourself! Hack-saw a LA-CO Fluxed soldered job in half and see the perfect bond. Write on company letterhead for sample of LA-CO Regular Flux (Liquid).

There are other LA-CO Fluxes for all specialized needs . . . in liquid, paste or handy stick form. Flux problems? Let our laboratories help; no obligation, of course.

The Lake Chemical Co., 3072 W. Carroll Ave., Chicago 12, Ill.

appointments

(Continued)

he became plant manager in 1938. He has been Pittsburgh plant manager since 1949. John A. Houston has been named assistant general manager of the company's Philadelphia steel service plant. For the past four years he has been assistant general manager of sales for the firm's nationwide group of service plants, with headquarters in Chicago. He was been with Ryerson since 1934.

► **FRED E. WELDON** as vice president in charge of eastern sales for General Controls Co. Mr. Weldon joined the firm in 1946 and has been sales manager with headquarters in the middle west since 1952.



Fred E. Weldon



R. R. Pryor

► **R. R. PRYOR** as vice president, sales, for Trion, Inc. Previously Mr. Pryor was manager of air filter sales for Pittsburgh Plate Glass Co. and before that was sales manager of the Glass Floss Div. of Tilo Roofing Co.

► **FRANK J. ANDERSON**, formerly outside salesman, as district manager of the Seattle office of Chase Brass & Copper Co. Mr. Anderson succeeds Melvin A. Pugh, who has retired after 36 years of service. Mr. Pugh, serving in various capacities, worked in the Los Angeles, San Francisco and Portland offices before going to Seattle as district manager.

► **JAMES A. MCQUILKIN** as manager of the Columbus branch of Wheeling Corrugating Co., succeeding Gilbert M. Long, who has been transferred to the general offices in Wheeling and appointed general sales manager. Frank J. Woodland Jr. has been appointed assistant to Mr. McQuilkin. Charles E. Creviston succeeds Mr. Woodland as assistant sales manager at the Columbus branch.

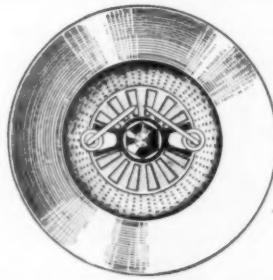
► **ALBERT F. JOHNSON** as district sales manager in southern Florida for Typhoon Air Conditioning Co. and Typhoon Heat Pump Co., both divisions of Hupp Corp. He will report to David P. Haring, recently appointed southeastern regional manager of the Typhoon divisions. Mr. Johnson was previously manager of central air conditioning sales for the Hupp Corp.'s Gibson Refrigerator Div., in which capacity he is being suc-



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The **BOSTON COMBUSTION HEAD**

to
correct
PULSATION
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POOR CO₂



Adaptable to any pressure atomizing burner. Available for 4", 5", and 6" blower tubes. Adjustable air shutters permit obtaining high efficiency sunflower flame or efficient non-pulsating flame.

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Statement of Ownership and Management of
AMERICAN ARTISAN
for October 1, 1958

The following is a statement of ownership, management, etc., as required by the act of Congress of August 24, 1912, as amended by the acts of March 3, 1933 and July 2, 1946 (Title 39, United States Code, Section 233) of American Artisan, published monthly at Chicago, Ill., for October 1, 1958.

1. The names and addresses of the publisher, editorial director, editor, and president are:

Publisher: Chas. E. Price, Glencoe, Illinois.

Editorial Director: C. M. Burnam, Jr., Chicago, Illinois.

Editor: C. M. Barnes, Chicago, Illinois.

President: Chas. E. Price, Glencoe, Illinois.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Keeney Publishing Company, 6 North Michigan Avenue, Chicago 2, Illinois. Stockholders: W. J. Osborn, Fairfield, Connecticut; Chas. E. Price, Glencoe, Illinois; Robert A. Jack, Cleveland Heights, Ohio.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

Chas. E. Price, President

Sworn to and subscribed before me this 16th day of September, 1958

Lydia Thomas

(SEAL)

[My commission expires November 22, 1959]

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handy and easy to operate
tools

No. 607 Angle Iron Shear . . .

Capacity 18 Tons
Cycle time 6 seconds
Motor 3 HP
Size Base Shear 14" x 12"
Size Base of Power Pack 14" x 34"
Shears 4" x 4" x 1/4" angle iron
3" x 1/2" flat
3/8" round and 1/2" square
stock in mild steel.

By means of a two way selector valve and four hoses, operator may use the No. 95 Hydraulic Punch to this same power pack and use in conjunction with the angle iron shear shown. Or, the angle iron shear may be added to a No. 95 Hydraulic Punch if that is what is now owned.

The No. 606 Angle Iron Shear uses a 1 1/2 HP Motor and has a cycle time of 10 seconds. Other capacities the same as the No. 607 Shear.



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W.A. WHITNEY MFG. CO.
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THE BLOW PIPE SUPPLY HOUSE

- ONE-PIECE BLOW PIPE ELBOWS
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From one source you can get all types of blow pipe parts and components . . . made in production quantities by Kirk & Blum. Depend on K & B manufacturing experience for superior blow pipe parts at less cost than hand made parts.

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heating and ventilating systems
with the NEW**



AIR

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Color-coded pushbuttons put air velocity, air temperature and static pressure at your fingertips in the new Model 60 Anemotherm Air Meter. Developed by the Anemostat Corporation of America, this versatile, accurate instrument helps you balance and check any air system. It pays for itself through time saved on only one major job.

• Write for Bulletin 55.

AC 1338A

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Full Line of Gas or Oil-Fired Warm Air Units

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Firewel's liberal PROFIT-MAKER PLAN means satisfaction for customers, profits for Dealers. Modern production line methods and engineering know-how enables you to buy for less and sell competitively. Write for details, choice territories available.



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appointments

(Continued)

sceeded by Milo J. Chavez. Charles D. Seltzer will replace Mr. Chavez as field sales manager of room air conditioners for the Gibson Div.

► R. L. TROUT as "PurAir" sales manager for Barnebey-Cheney Co. Mr. Trout joined the company in 1956 and served as assistant sales manager until his recent promotion.



R. L. Trout



William D. Gibson

► WILLIAM D. GIBSON as heating controls manager of the Portland (Ore.) electronics division of Iron Fireman Mfg. Co. In his new position, Mr. Gibson, formerly sales manager for the division, will be responsible for the design, production and sales of controls. He joined Iron Fireman in 1949.

► LINCOLN M. LARKIN as general manager of Whirlpool Corp.'s air conditioning division. Mr. Larkin has been product manager for air conditioning since joining the firm in 1955. Before that he was a regional sales manager for air conditioning with General Electric Co. He succeeds J. B. Ogden, who recently resigned.

► R. E. PARSHALL as assistant sales manager for the Ventilator Div. of The Swartwout Co. Mr. Parshall's duties will include the coordination of sales, advertising and promotion activities.

► W. D. HELM, former manager of Century Electric Co.'s Milwaukee branch office, as manager of the Chicago office. Mr. Helm succeeds Grant Hodgskiss who has been appointed manager of the Omaha office. Mr. Hodgskiss replaces J. S. Jervis, who is retiring after 42 years of service with the company. Named acting district manager of the Milwaukee branch is F. L. Beattie, an application engineer.

► SWEIGER-DAVIDSON Co., 1321 S. Michigan Ave., Chicago, as heating and air conditioning representative for McQuay, Inc., in the Chicago area.

► IRVINGTON SALES, INC., 1413 Hertel Ave., Buffalo 16, N. Y., as a manufacturer's representative for Tuck-Aire Furnace Co. Irvington Sales will handle both

UNION SHEET METAL SUPPLY, INC.

SEAMLESS, LONG-LENGTH GUTTER — TO YOUR SPECIFIED LENGTH UP TO 32 FEET

WITH 3 INCH SQUARE CORRUGATED CONDUCTOR PIPE AND "A" OR "B" ELBOWS

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WE WILL SEND
FULL INFORMATION
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FURNACE PIPE AND FITTINGS

5 INCH, 6 INCH, 7 INCH SNAP-LOCK ROUND PIPE 5 FOOT AND
2 FOOT LENGTHS, WITH ELBOWS AND BOOTS

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Permanent aluminum soldering is made simple and easy with ALLEN Alumi-Soder. Complete in itself, flux and solder are combined in exactly the right proportion in a convenient "handy-to-use" stick.

PERFORATED METALS FOR EVERY INDUSTRIAL USE

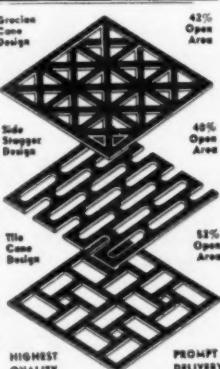
The "Ornamental" light-gauge designs here illustrated are only a few of the many you can choose from in our new Catalog 39 and we are always pleased to quote on original designs or special work of any kind.

For larger unit-openings, using metals up to $\frac{1}{4}$ " in thickness, we offer a wide variety of equally attractive designs in our Catalog 36 on Diamond Architectural Grilles.

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ADJUSTABLE BAR FOLDER

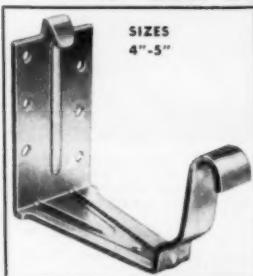
Sheet metal men like the counter-balance of the folding bar...the "one-motion" speed of clamp and fold...the adjustable stop for forming any angle...with accurate hems, locks, S-clips and drive cleats. Write for details.



Complete line of machines and tools for sheet metal work.

THE PECK, STOW & WILCOX COMPANY, SINCE 1885, SOUTHINGTON, CONNECTICUT, U.S.A.

Announcing the NEW ALUMINUM "K" BOX GUTTER HANGER



PROFILE—Designed to fit contour of "K" Gutter perfectly.

RIB-in back-acts as a guide for gutter, prevents gutter from catching on nail heads.

An **ALUMINUM HANGER**—with extra embossment for strength.

Manufactured by
Berger Bros. Company
229-237 Arch St.
Philadelphia 6, Pa.

50 per carton including Snap Strap
SOLD THRU LEADING JOBBERS EVERYWHERE

Elegant Ventilating Specialties

NEW! EXTRUDED ALUMINUM SHUTTERS

Shutters of modern design which give you all of these features: Lightweight, Full Weather Strip, Low Freight Cost, Easier Installation, Concealed Pivot Pins, Rust and corrosion Proof and Natural aluminum finish with fluted frames.

Write for complete specifications.

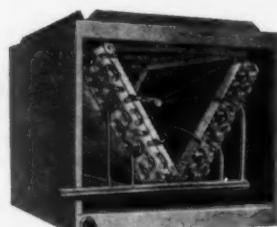


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**Quick
Delivery
to South &
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ADD-ON
COILS**

Stock Sizes
2, 3, 4, 5, 6, & 7.5 Ton



**Magic Aire Division
UNITED ELECTRIC CO.**

P.O. Box 119 Wichita Falls, Texas

appointments

(Continued)

"Atlas" and "Western" heating and air conditioning equipment for residential and commercial applications.

► KENNETH J. FLAHERTY as a representative for the Trane Co. in the Columbus, O., area. Mr. Flaherty will specialize in the sale of "Climate Changer" residential and commercial self-contained air conditioning equipment. Other new "Climate Changer" representatives are Joseph A. Shea, who will cover Allentown, Pa., and Robert D. Trebilcox, who will serve Milwaukee.

► DAN B. BILLINGTON as manufacturer's representative handling the sale of "Quiet Duct" silencers for air conditioning systems in the Cleveland area for Industrial Acoustics Co., Inc. Other new "Quiet Duct" representatives are Jack Chichester, Mobile, Ala.; Empire State Equipment Co., Providence, R. I.; The Houston Co., Lubbock, Tex.; and The Airadyne Co., West Roxbury, Mass.

► FRANK J. CENTO as a sales engineer for Delavan Mfg. Co. He was formerly a sales engineer for National-U.S. Radiator Corp., covering the metropolitan St. Louis area.



SWIVEL HEAD SQUEEZER TONGS

For closing Government box lock connection on duct work and all standing seams. Swivel head makes tongs usable on all four sides, in either vertical or horizontal position.

for a complete
line of HANDY
TOOLS AND
EQUIPMENT
... see



CLEAT DRIVE NOTCHER
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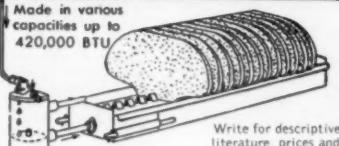
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